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Volume II

12

FRACTURE MECHANICS EVALUATION OF B-1 MATERIALS

Volume II FATIGUE CRACK GROWTH DATA

ROCKWELL INTERNATIONAL
B-1 DIVISION
LOS ANGELES, CALIFORNIA

OCTOBER 1976

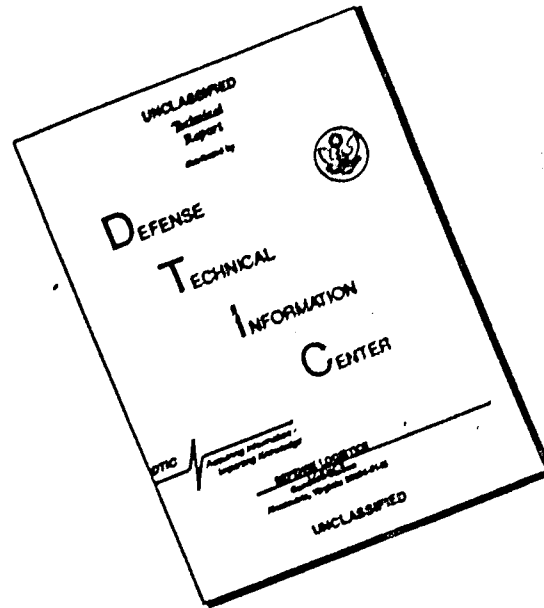
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This technical report has been reviewed and is approved for publication.

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18. SUPPLEMENTARY NOTES This report was prepared to document the materials evaluation efforts required to support the application of Fracture Mechanics Design Methodology to the B-1 Strategic Bomber.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Fracture Mechanics Crack Growth Fracture Toughness Stress Corrosion Materials Evaluation		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) A total of 1764 fracture mechanics tests — K_{Ic} , K_{IIc} , K_{ISCC} , and da/dN — were conducted on fourteen alloys to develop property data for use in the B-1 design. Tests were performed on aluminum alloys 2024, 2124, 2219, 7049, 7050, 7075 and 7175; titanium alloy Ti-6Al-4V; steel alloys 9Ni-4Co-.20C, 9Ni-4Co-.30C and 300M; corrosion resistant steel PH13-8Mo; nickel alloy Inconel 718; and nickel-cobalt alloy MP 35 N. The effects of product form, heat-to-heat variability, grain orientation, and heat treat condition on fracture behavior were investigated. In addition, the fracture properties		

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of welds in Ti-6Al-4V, PH13-8Mo and 9-4-.20 alloys and of diffusion bonds in Ti-6Al-4V were determined. Testing variables were temperature, specimen thickness; environment, cyclic frequency and R-factor for the da/dN tests; temperature and specimen thickness for the K_{IC} tests; temperature for the K_{Isc} tests; and environment for the K_{Isc} tests.

The results of the tests are presented in tables and graphs in detailed and summarized forms. The effects of the various material and testing variables on fracture behavior are discussed.



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FOREWORD

This work was performed by Rockwell International under USAF Contract No. F33657-70-C-0800 in support of the application of fracture mechanics design requirement to the B-1 Strategic Bomber. The Air Force review team which directed this activity was headed by Mr. C. F. Tiffany, ASD/ENF and included the following personnel:

Mr. B. R. Meadows	B-1 SPO
Sgt. R. Bullock	B-1 SPO
Mr. M. A. Owens	B-1 SPO
Mr. H. W. Wood	AFFDL/FBE
Mr. N. G. Tupper	AFML/LLS
MR. A. W. Gunderson	AFML/MXE

The Rockwell International personnel primarily involved in this test effort included Mr. N. Klimmek, Dr. A. Summers, Mr. W. Padian, Mr. R. Ferguson, Mr. M. Katcher, Dr. L. Kasher, Mr. M. Harrigan, and Mr. J. Young, all of the Materials and Producibility Group, and Mr. G. Fitch of the Fatigue and Fracture Design Group.

The body of the report was assembled by Rockwell International as NA-74-862 to document this significant testing effort. Because of the wide scope of materials included and the general interest in the fracture mechanics data it was deemed appropriate to provide a wider distribution by releasing this document as an Air Force Materials Laboratory Technical Report.

The test program was conducted from December 1970 to December 1974. Testing in the program was performed by the Rockwell International Laboratories, Los Angeles, California; by the Air Force Materials Laboratory, WPAFB, Ohio; by the University of Dayton Research Institute, Dayton, Ohio; by the Lockheed California Company, Saugus, California, and by General Dynamics, Fort Worth, Texas.

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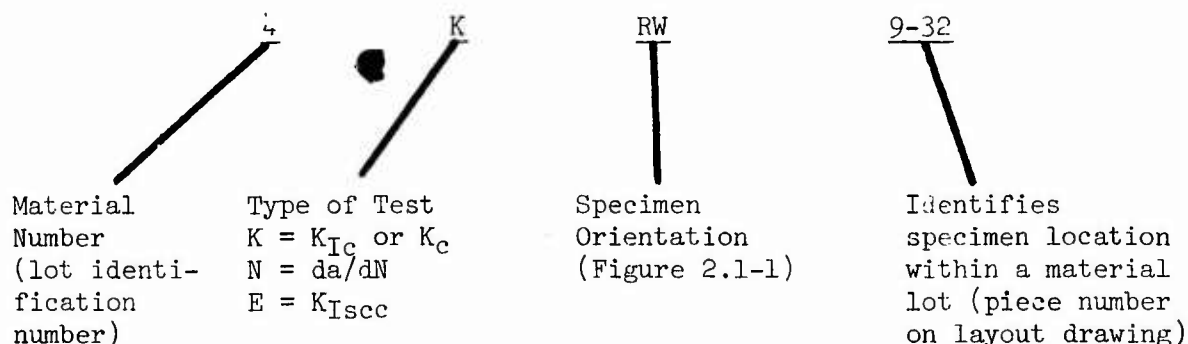
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INTRODUCTION

1.0 The fatigue crack growth rate data developed under this program is presented in this volume; organized by alloy type. A summary of the overall program is shown in Table I. A brief explanation of the specimen identification and program outline follows but for specific details of the testing procedures the reader is referred to Volume I. The data reduction technique used in the da/dN plots was the point to point method using the midspan crack length for the stress intensity calculation.

2.0 MATERIAL AND SPECIMEN IDENTIFICATION SYSTEM

Tests were conducted on over 90 lots of alloy in the program. As each lot of material was received it was assigned a material number, which became the first number in the identification system of each specimen fabricated from that lot. The specimen numbering system, described below, provided precise traceability back to the specimen location in the original lot of material.



For weldments, the specimen orientation is that of the parent metal in the specimen. For diffusion bond joints, two specimen orientations are shown in the specimen number separated by a slash number (e.g., RW/TR) to show the orientation of the parent metal on each side of the joint.

3.0 ENVIRONMENTS

Ten test environments were used in this program:

(1) Laboratory Air (LA) - The environment contained within the test facility, without control on humidity.

(2) Low Humidity Air (LHA) - A dry air environment of 10% or less relative humidity, as obtained by sealing the crack propagation zone within an enclosure containing freshly dried desiccant.

(3) 100% Humidity Air (100% Hum.) - A moist air environment obtained by sealing the crack propagation zone within an enclosure partially filled with commercially available distilled water. The liquid was not allowed to rise to the level of the crack propagation zone.

(4) Distilled Water (Dist H₂O) - A liquid environment of commercially available distilled water.

(5) Fuel Tank Sump Residue Water (STW) - A liquid environment of a .12% metal chloride solution consisting of distilled water with the following additions:

CaCl ₂	50 PPM	CrCl ₃	6H ₂ O	1 PPM
CdCl ₂	1000 PPM	CuCl ₃	2H ₂ O	1 PPM
MgCl ₂	50 PPM	FeCl ₃		5 PPM
NaCl	100 PPM	MnCl ₂	4H ₂ O	5 PPM
ZnCl ₂	10 PPM	NiCl ₂	6H ₂ O	1 PPM
PbCl ₂	1 PPM			

(6) Field Cleaning Solvent (FCS) - A liquid environment of a trisodium phosphate type cleaning solution consisting of 1 part MIL-C-25769 material to 8 parts water by volume.

(7) Shop Cleaning Solvent (SCS) - A liquid environment of an aliphatic naphtha per specification TT-N-95.

(8) Freon TF (FTF) - A liquid environment of a commonly used metal cleaning agent, Trichlorotrifluoroethane.

(9) Fuel - A liquid environment of JP-4 jet fuel saturated with distilled water.

(10) 90% Fuel + 10% Sump Tank Water (JP4 & STW) - A cyclic liquid environment of sump tank water then jet fuel, per (5) and (9) above. One complete environmental cycle consisted of 1.6 hours in STW followed by 14.4 hours in JP-4. Environmental cycling was continued throughout the duration of each test.

Da/DN testing was conducted in all ten environments, while K_{Isc} testing was conducted only in STW, FCS, and SCS environments (numbers (5), (6), and (7)). All K_{Ic} and K_c testing was conducted in a laboratory air environment (LA).

Environments (4) through (10) applied to FCCR specimens by means of clear plastic chambers enclosing the crack propagation zone of the specimen. The chambers were equipped with inlet and outlet parts which allowed the liquid to flow through by gravity differential. In K_{Isc} testing, the specimens were immersed vertically in the liquid environments to just below the level of the loading bolts.

Table 1

FRACTURE MECHANICS MATERIAL TEST PROGRAM SUMMARY

Materials	No. of Lots of Indicated Product Form				Number of Tests								Total Specimens
	Sheet	Plate	Extru- sion	Rolled or Forged Bar ing	K _{Ic}		K _c		K _{Isc}	ΔK vs. da/dN			
					CT	PTC	CT	CCT	DCB	CT	CCT	PTC	
Ti-6Al-4V	2	23	2	4	184	-	24	8	63	122	9	-	410
Ti-6Al-4V GTA Weld	1	6	1		11	38	-	2	29	5	2	36	123
2024/2124	2	8		2	86	-	17	11	19	55	16	-	204
2219		6	1	1	56	-	9	-	15	40	-	-	120
7075-T76xxx	2	5	1		50	-	10	5	9	25	8	-	107
7075-T73xxx			2	1	30	-	14	-	8	31	-	-	63
7049				3	10	-	4	-	13	14	-	-	41
7175				2	10	-	-	-	12	18	-	-	40
7050		1		1	12	-	-	-	2	6	-	-	20
HP-9Ni-4Co-C.20C		2		6	99	-	10	-	20	40	-	-	169
HP-9-4-20 GTA Weld		2		1	5	27	-	-	12	7	-	20	71
HP-9Ni-4Co-0.30C				2	32	-	-	-	-	20	-	-	52
PH13-8Mo			1	5	83	-	14	-	47	35	-	-	179
PH13-8Mo GTA Weld			1	1	8	14	-	-	21	4	-	8	55
300M					15	-	-	-	12	17	-	-	44
Inconel 718				1	20	-	-	-	8	14	-	-	42
MP35N				1	1	-	-	-	3	-	-	-	4
Total Specimens/Category					712	79	102	26	293	453	35	64	1,764

APPENDIX A

FATIGUE CRACK GROWTH RATE
CURVES FOR ALL Ti-6Al-4V
ALLOY TESTS (EXCLUDING WELDMENTS)

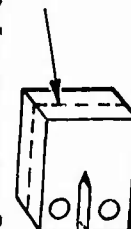
APPENDIX A: INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"w"	"H/w"	"t"	Environ-ment	Test Temp	"R"	Freq (CPM)	Page No
DBTC	61 NRW 3-3	RW	6.0	0.6	0.5	LHA	R.T.	0.3	60	A-1
DB	61 NRW 3-4	WR	6.0	0.6	1.0	LHA	R.T.	0.3	360	A-2
DB	62 NRW 4-1, -2	RW	6.0	0.6	1.0	LHA	R.T.	0.3	60	A-3
DB	62 NRW 4-5, -6	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	A-4
M.A.	62 NRW 4-7	RW	6.0	0.6	0.7	LHA	R.T.	0.3	60	A-5
DB	62 NRW 4-23	RW	6.0	0.6	1.0	LHA	R.T.	0.3	1800	A-6
M.A.	62 NRW 4-32	RW	5.0	0.6	0.5	LHA	R.T.	0.3	60	A-7
M.A.	62 NRW 4-33	RW	5.0	0.6	0.5	STW	R.T.	0.3	60	A-8
DBTC	62 NRW 4-34	RW	6.0	0.6	0.5	LHA	R.T.	0.08	60	A-9
DBTC	62 NRW 4-271	RW	6.0	0.6	0.5	LHA	R.T.	0.08	60	A-10
B.A.	62 NRW 4-281	RW	6.0	0.6	0.5	LHA	R.T.	0.3	60	A-11
STOA	62 NRW 4-291	RW	6.0	0.6	0.5	LHA	R.T.	0.3	60	A-12
DBTC	63 NRW 10-10	WR	6.0	0.6	1.0	LHA	R.T.	0.3	60	A-13
DBTC	63 NRW 10-12	RW	6.0	0.6	1.0	LHA	R.T.	0.3	60	A-14
DBTC	63 NRW 10-14	RW	6.0	0.6	1.0	STW	R.T.	0.3	60	A-15
M.A.	64 NRW 11-7	RW	3.77	0.477	1.0	LHA	R.T.	0.08	360	A-16
M.A.	64 NRW 11-8	RW	3.77	0.477	1.0	STW	R.T.	0.08	60	A-17
M.A.	64 NRW 11-9	RW	3.77	0.477	1.0	JP4	R.T.	0.08	60	A-18
M.A.	64 NRW 11-10	RW	3.77	0.477	1.0	LHA	R.T.	0.08	60	A-19
M.A.	64 NRW 11-11	RW	3.77	0.477	1.0	LHA	R.T.	0.5	360	A-20
M.A.	64 NRW 11-12	RW	3.77	0.477	1.0	LHA	R.T.	0.3	360	A-21
M.A.	64 NRW 11-13	WR	3.77	0.477	1.0	LHA	R.T.	0.08	360	A-22
M.A.	64 NRW 11-14	WR	3.77	0.477	1.0	STW	R.T.	0.08	60	A-23
M.A.	66 NRW 16-1	WR	6.0	0.6	1.0	LHA	R.T.	0.3	60, 360	A-24
M.A.	66 NRW 16-3	RW	6.0	0.6	1.0	LHA	R.T.	0.3	60, 360	A-25
M.A.	66 NRW 16-4	RW	6.0	0.6	1.0	STW	R.T.	0.3	60	A-26
M.A.	66 NRW 16-5	RW	6.0	0.6	1.0	LHA	R.T.	0.3	60	A-27
M.A.	66 NRW 16-16	RW	6.0	0.6	1.0	STW	R.T.	0.3	60	A-28

MILL BETA PROCESSED PLUS:

NOTES: All figures on this page are for CT specimens.

* Bond plane location. Orientation of the parent metal on each side of the joint was the same.



APPENDIX A: INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No
R.A.	67 NWR 29-1	WR	7.4	0.486	1.0	LHA	R.T.	0.5	360	A-29
DBTC	67 NWR 29-2	WR	7.19	0.5	1.0	STW	R.T.	0.08	60	A-30
DBTC	67 NWR 29-3	WR	7.19	0.5	1.0	LHA	R.T.	0.08	60	A-31
R.A.	67 NWR 29-4	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-32
R.A.	67 NWR 29-5	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-33
R.A.	67 NWR 29-8	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-34
R.A.	67 NWR 29-15	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-35
R.A.	67 NWR 29-16	RW	7.4	0.486	1.0	LHA	R.T.	0.3	60	A-36
R.A.	67 NWR 29-17	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	A-37
R.A.	67 NWR 29-19	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	A-38
R.A.	67 NWR 29-20	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-39
R.A.	67 NWR 29-21	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-40
R.A.	67 NWR 29-38	RW	5.0	0.6	1.0	LHA	265	0.08	360	A-41
R.A.	68 NWR 32-10	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-42
R.A.	68 NWR 32-11	RW	7.4	0.486	1.0	STW	150	0.08	60	A-43
R.A.	68 NWR 32-12	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-44
R.A.	69 NWR 33-7	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	A-45
R.A.	70 NWR 39-13	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-46
DBTC	70 NWR 39-14	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-47
R.A.	70 NWR 40-16	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-48
R.A.	72 NWR 46-1	RW	4.0	0.5	1.38	FCS	R.T.	0.08	60	A-49
R.A.	72 NWR 46-2	WR	4.0	0.6	1.38	STW	R.T.	0.08	60	A-50
DBTC	72 NWR 46-24	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-51
DBTC	72 NWR 46-25	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-52
R.A.	72 NWR 46-26	RW	7.4	0.486	1.0	LHA	R.T.	0.08	3600	A-53
R.A.	72 NWR 46-27	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-54
R.A.	72 NWR 46-28	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	A-55
R.A.	72 NWR 46-29	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	A-56
R.A.	72 NWR 46-30	RW	7.4	0.486	1.0	JP4	R.T.	0.08	60	A-57

NOTE: All figures on this page are for CT specimens.

APPENDIX A: INDEX OF FIGURES

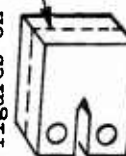
Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No
R.A.	72 NRW 46-31	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	A-58
R.A.	72 NRW 46-32	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-59
R.A.	72 NRW 46-33	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	A-60
R.A.	72 NRW 46-34	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	A-61
R.A.	72 NRW 46-35	RW	7.4	0.486	1.0	LHA	R.T.	0.7	360	A-62
R.A.	72 NRW 46-36	RW	7.4	0.486	1.0	LHA	265	0.08	360	A-63
R.A.	72 NRW 46-37	RW	7.4	0.486	1.0	LHA	-65	0.08	360	A-64
R.A.	72 NRW 46-38	RW	7.4	0.486	0.25	LHA	R.T.	0.08	360	A-65
R.A.	72 NRW 46-39	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	A-66
DBTC	72 NRW 46-40	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-67
R.A.	72 NRW 46-41	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-68
R.A.	72 NRW 46-42	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-69
R.A.	72 NRW 46-43	WR	7.4	0.486	1.0	JP4	R.T.	0.08	60	A-70
R.A.	72 NRW 46-44	WR	7.4	0.486	0.5	LHA	R.T.	0.08	360	A-71
R.A.	72 NRW 46-79	RW	7.4	0.486	0.4	STW	R.T.	0.08	60	A-72
DB **	74 NTW 52-1	TW/TW	6.0	0.6	1.0	LHA	R.T.	0.08	360	A-73
DB **	74 NTW 52-2	TW/TW	6.0	0.6	1.0	STW	R.T.	0.08	60	A-74
DB *	74 NTW 52-3	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	A-75
DB **	74 NTW 52-20	TW/TW	5.0	0.486	1.0	STW	R.T.	0.08	60	A-76
DB +TR**	74 NTW 52-21	TW/TW	5.0	0.486	1.0	STW	R.T.	0.08	60	A-77
DB *	74 NTW 52-22	WR	5.0	0.486	1.0	LHA	R.T.	0.08	360	A-78
DB **	74 NTW 53-1A	TW/TW	5.0	0.486	1.0	LHA	R.T.	0.08	360	A-79
+2DBTC *	74 NTW 53-3	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	A-80
DB +2DBTC **	74 NTW 54-1	TW/TW	6.0	0.6	1.0	LHA	R.T.	0.08	360	A-81
DB +4DBTC *	74 NTW 54-3	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	A-82
BETA EXTR. M.A.	75 NRW 59-1	RW	5.0	0.486	1.0	LHA	R.T.	0.08	360	A-83
R.A.	76 NRW 61-16	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-84
R.A.	76 NRW 61-151	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	A-85

Bond plane location.
Orientation of the parent metal on each side of the joint is listed.



**

NOTE: All figures on this page are for CT specimens.
Bond plane location. Orientation of parent metal on each side of the joint was the same.



*

APPENDIX A: INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environ- ment	Test Temp	"R"	Freq (CFM)	Page No
DBTC	77 NRW 1A1-B	RW	7.4	0.486	0.35	STW	R.T.	0.08	60	A-86
DBT + PC	77 NRW 1A2-B	WR	7.4	0.486	0.35	STW	R.T.	0.08	60	A-87
DBTC -TR	77 NRW YDL-15A	WR	5.0	0.486	1.0	STW	R.T.	0.08	60	A-88
DBTC **	77 NRW YDL-15B	WR	5.0	0.486	1.0	STW+JP4	R.T.	0.08	60	A-89
DB **	77 NRW 1A-1	RW/RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-90
DB **	77 NRW LD-12	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-91
R.A.	77 NRW YDL-4	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-92
R.A.	77 NRW YDL-5	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-93
R.A.	77 NRW YDL-4	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-94
R.A.	77 NRW YDL-5	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-95
R.A.	77 NRW YDL-16	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-96
R.A.	77 NRW YDL-17	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-97
R.A.	79 NRW 77-1	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	A-98
R.A.	79 NRW 77-2	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-99
R.A.	79 NRW 77-3	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	A-100
R.A.	79 NRW 77-4	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	A-101
R.A.	79 NRW 77-5	RW	7.4	0.486	0.5	STW	R.T.	0.5	60	A-102
R.A.	79 NRW 77-20	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-103
R.A.	79 NRW 77-21	WR	7.4	0.486	0.75	STW	R.T.	0.08	60	A-104
R.A.	79 NRW 77-22	WR	7.4	0.486	0.65	STW	R.T.	0.5	60	A-105
R.A.	79 NRW 77-23	RW	7.4	0.486	1.0	JP4	R.T.	0.08	60	A-106
R.A.	79 NRW 77-24	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-107
M.A.	80 NRW 84-5	RW			0.1	LHA	R.T.	0.08	60	A-108
M.A.	80 NRW 84-6	RW			0.1	LHA	R.T.	0.08	360	A-109
M.A.	80 NRW 84-7	RW			0.1	LHA	R.T.	0.3	360	A-110
M.A.	80 NRW 84-8	RW			0.1	LHA	R.T.	0.5	360	A-111
M.A.	80 NRW 84-9	RW			0.1	JP4	R.T.	0.08	360	A-112
M.A.	80 NRW 84-10	RW			0.1	STW	R.T.	0.08	60	A-113
M.A.	80 NRW 84-13	WR			0.1	LHA	R.T.	0.08	360	A-114
M.A.	80 NRW 84-14	WR			0.1	STW	R.T.	0.08	360	A-115
M.A.	81 NRW 94-1	RW			0.1	LHA	R.T.	0.08	360	A-116

NOTE: Figures 80 NRW 84-5 through 81 NRW 94-1 are for CCT specimens, all others are for CT specimens.

** See preceding page

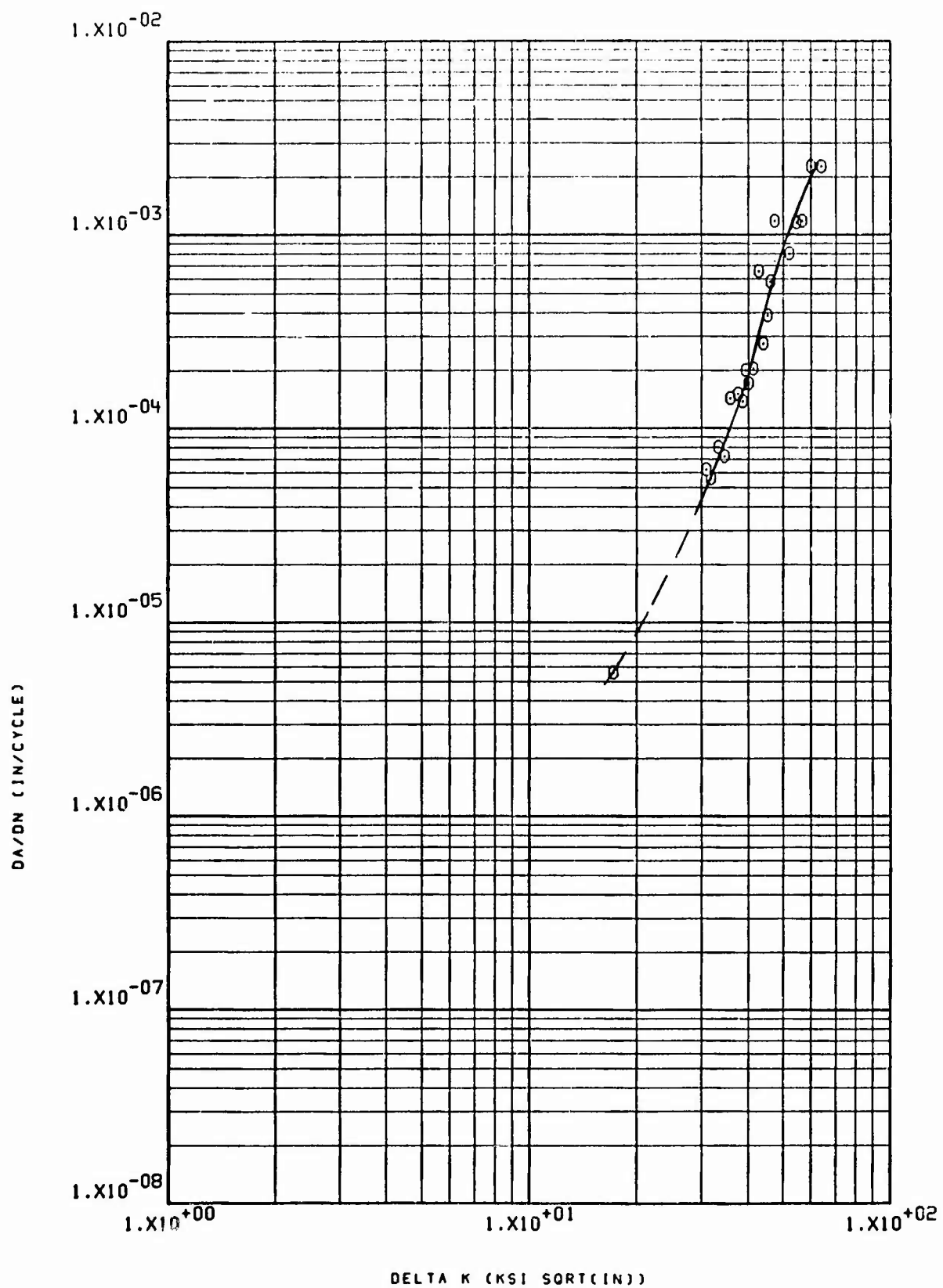
APPENDIX A: INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"H"	"H/W"	"C"	Environment	Test Temp	"R"	Freq (CPM)	Page No
R.A.	82 NRW 95-5	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-117
R.A.	82 NRW 95-8	WR	7.4	0.486	1.0	LEA	R.T.	0.5	360	A-118
R.A.	82 NRW 95-9	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-119
R.A.	84 NRW 103-1	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	A-120
R.A.	84 NRW 103-2	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	A-121
R.A.	85 NRW 104-1	RW	6.0	0.6	0.9	STW	R.T.	0.08	60	A-122
R.A.	85 NRW 104-2	WR	6.0	0.6	0.9	STW	R.T.	0.08	60	A-123
R.A.	86 NRW 107-1	WR	7.4	0.486	0.4	STW	R.T.	0.08	60	A-124
DB **	90 NRW 032A	RW/RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-125
DB **	90 NRW 032D	WR/WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-126
R.A.	253 NRW 1020	RW	5.0	0.6	1.0	STW	R.T.	0.08	60	A-127
R.A.	294 NRW 1022	RW	5.0	0.6	1.0	STW	R.T.	0.08	60	A-128
R.A.	7406 NRW 1016A	RW	4.88	0.486	0.75	STW	R.T.	0.08	60	A-129
R.A.	7763 NRW 1017A	RW	4.88	0.486	0.75	STW	R.T.	0.08	60	A-130
	IL200021 1-1	RW or WR	3.77	0.477	0.5	STW	R.T.	0.08	60	A-131
	IL200021 N-2	RW or WR	3.77	0.477	0.5	STW	R.T.	0.08	60	A-132
	IL200021 O-3	RW or WR	3.77	0.477	0.5	STW	R.T.	0.08	60	A-133
	IL200021 O-4	RW or WR	3.77	0.477	0.5	STW	R.T.	0.08	60	A-134
DBWM.P. **	2D03-1 NRW/TR	RW/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-135
DBWM.P. **	2D04-1 NRW/TR	RW/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-136
DBWM.P. **	2D05-1 NRW/TR	RW/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-137
DBWH102 **	2D06-1 NRW/TR	RW/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-138
DBWM.P. **	3DA3-1 NRW/TR	WR/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-139
DBWM.P. **	3DA4-1 NRW/TR	WR/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-140
DBWM.P. **	3DA5-1 NRW/TR	WR/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-141
DBWH102 **	4DA6-1 NRW/TR	WR/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-142

Bond plane orientation. Orientation of parent metal on each side of the joint is listed in "Direction" Column



NOTE: All Figures on this page are for CT specimens.

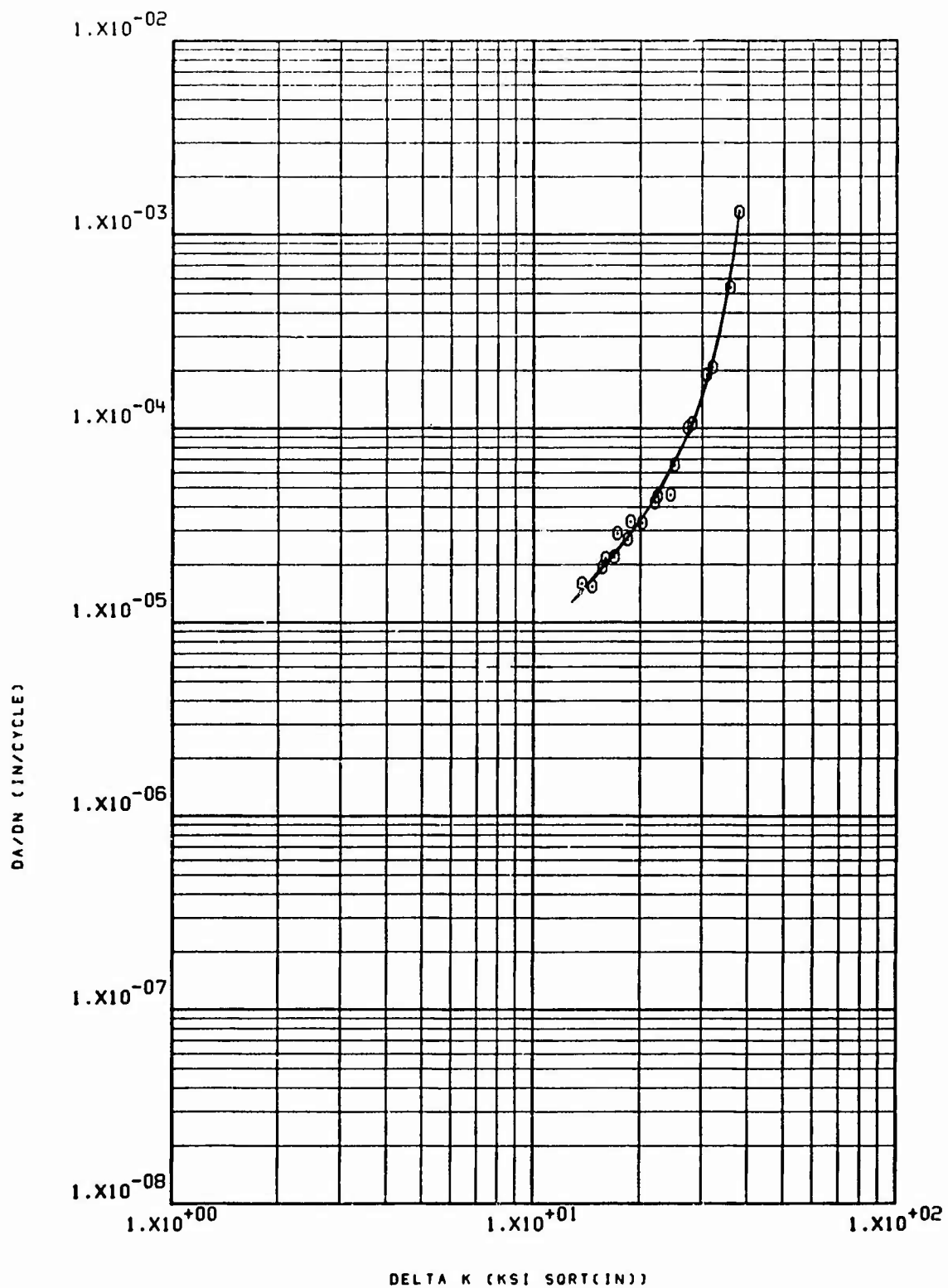


61 NRW 3-3

TI-6AL-4V RA DBTC

LHA RT R=0.3

60CPH

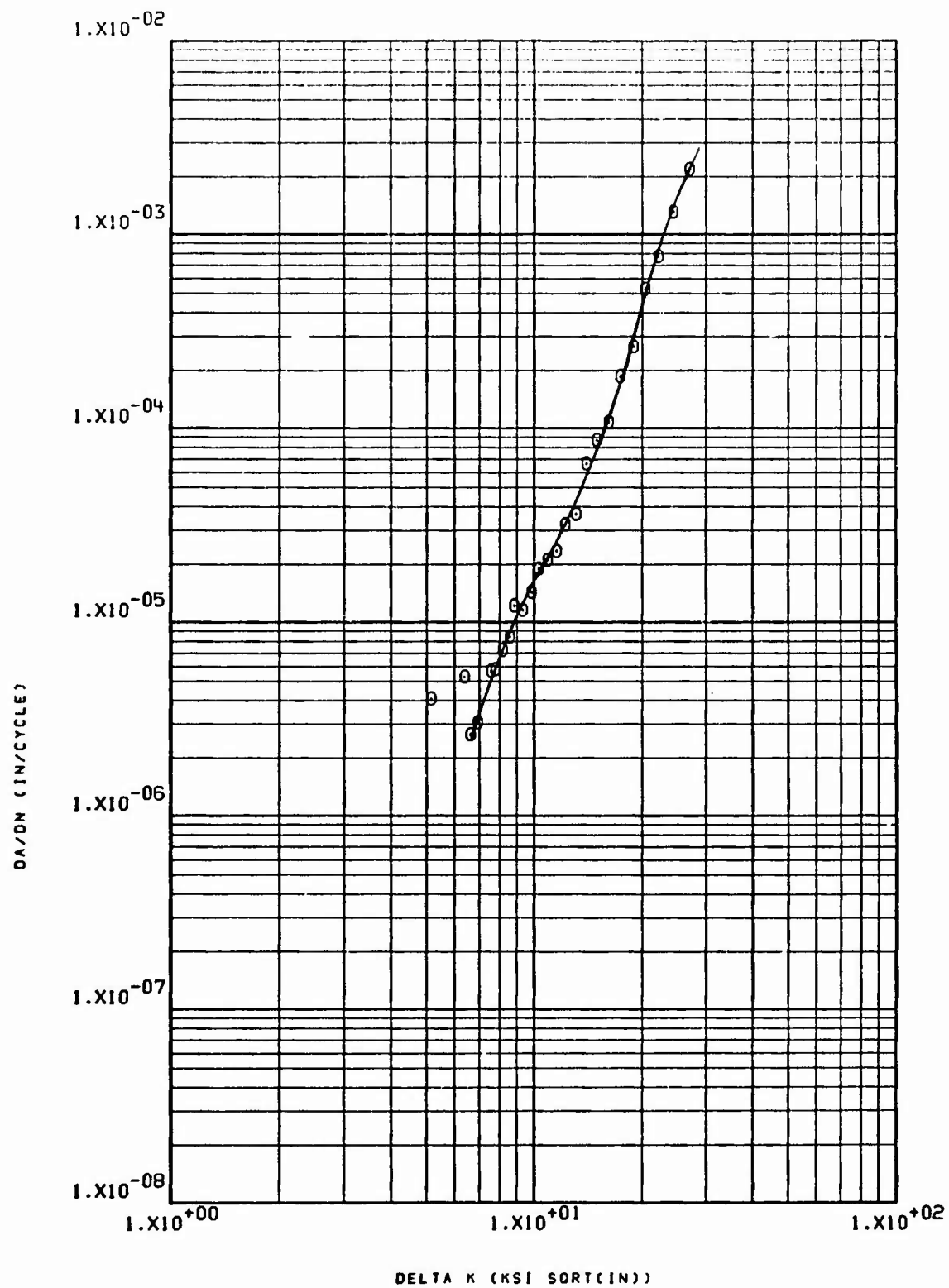


61 NWR 3-4

TI-6AL-4V DB

LHA RT R=0.3

360CPH

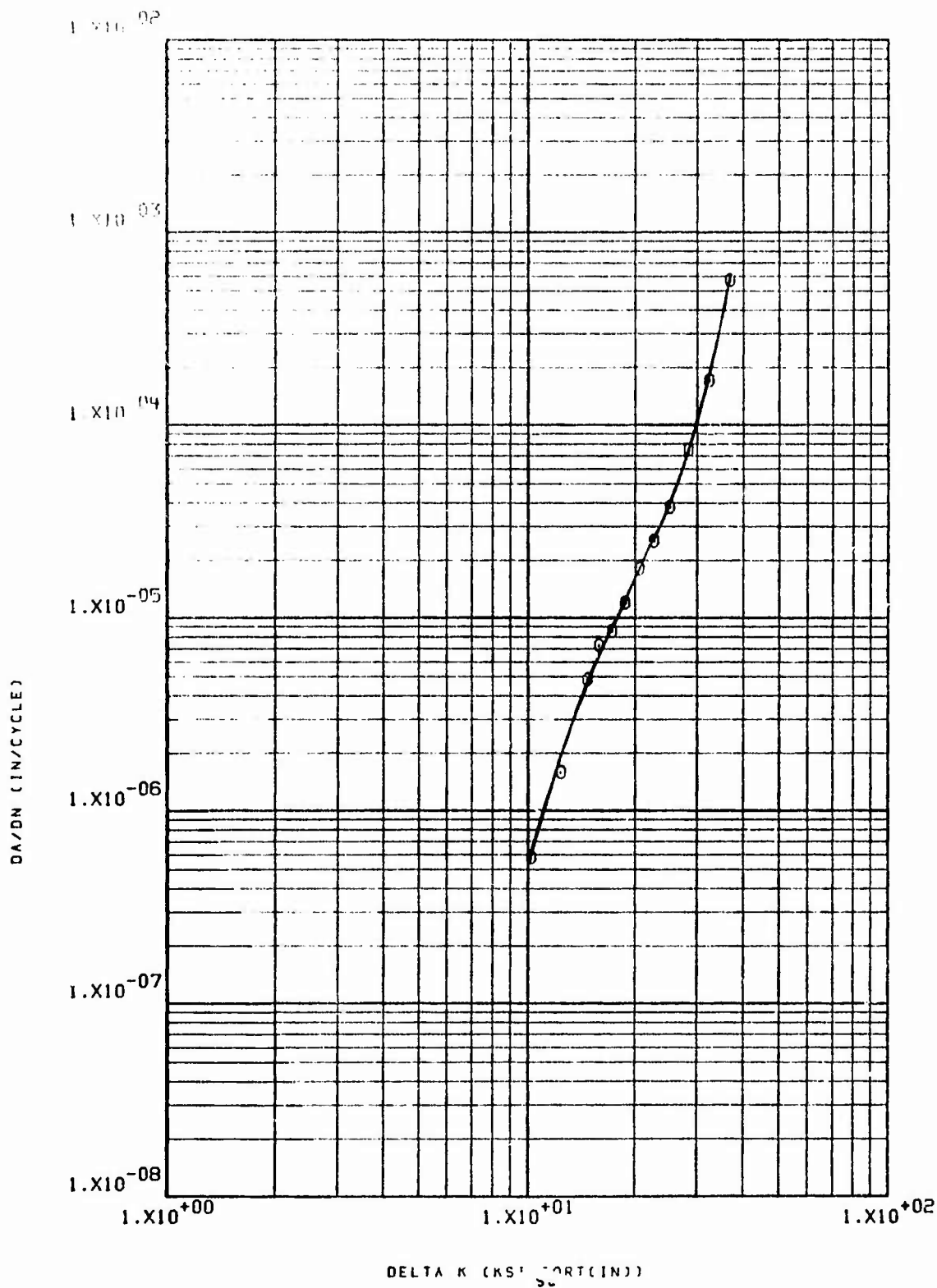


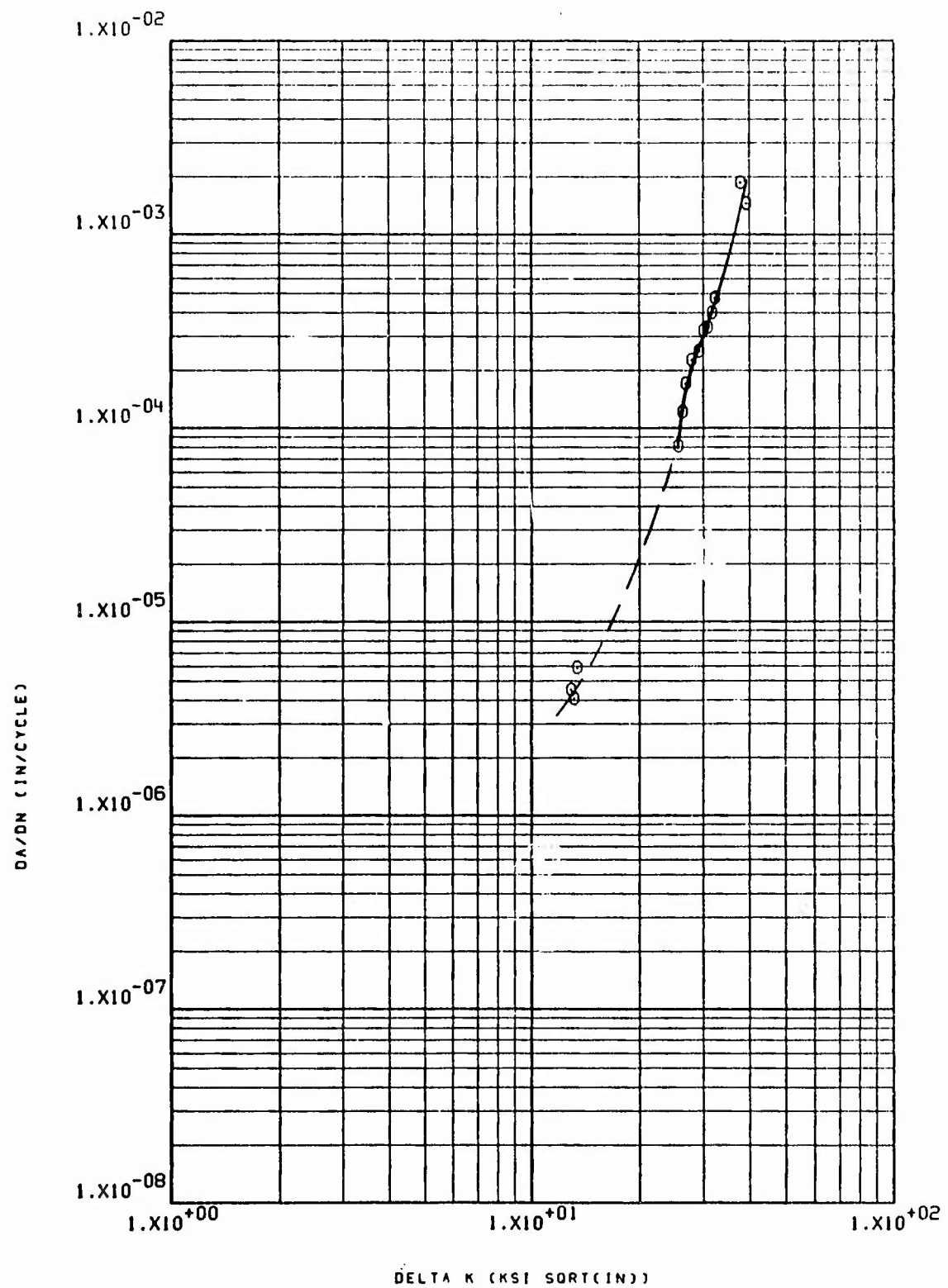
62 NRW 4-1

TI-6AL-4V DB

LHA RT R=0.3

60CPH



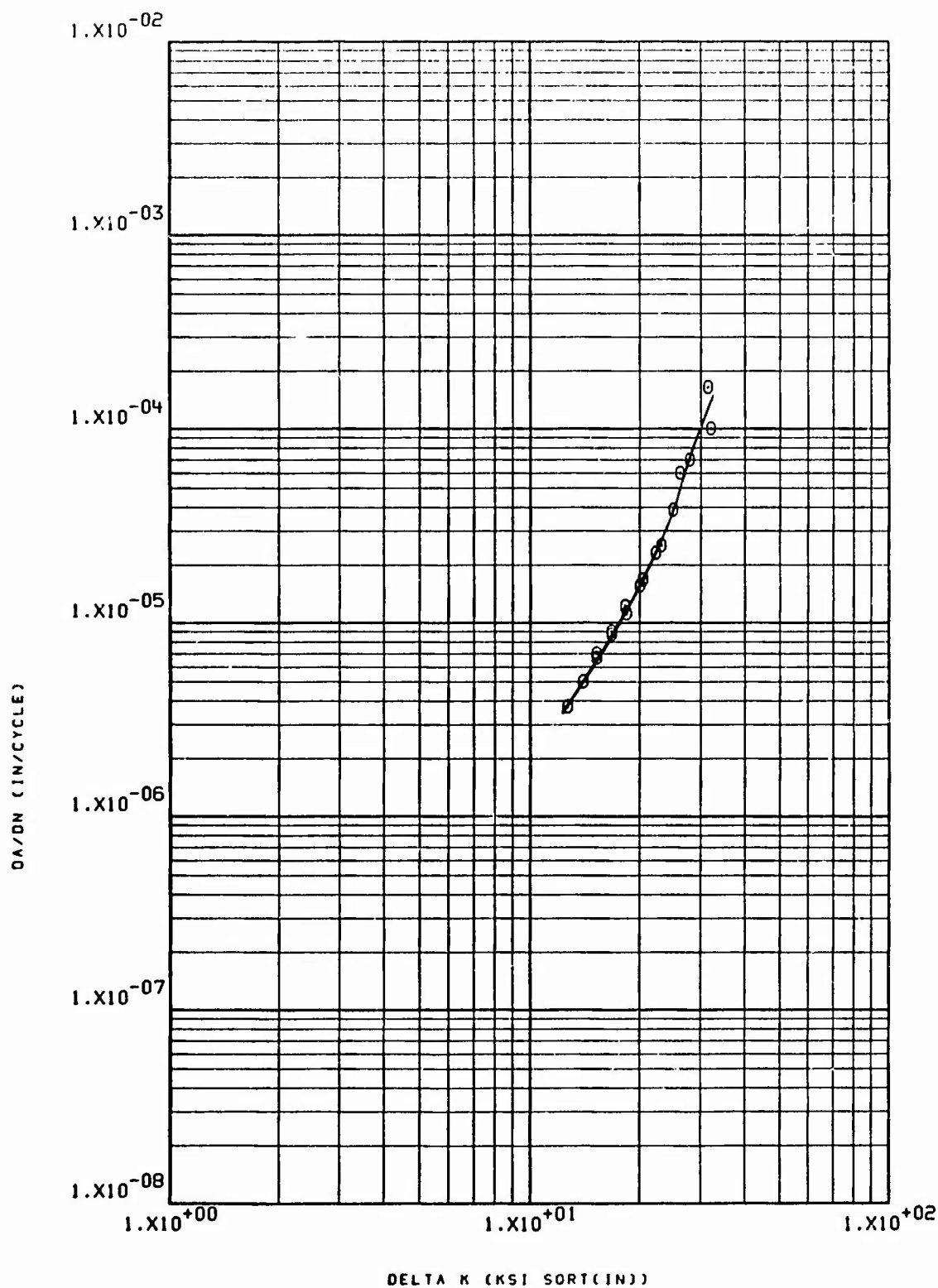


62 NRW 4-7

TI-6AL-4V MILL ANN.

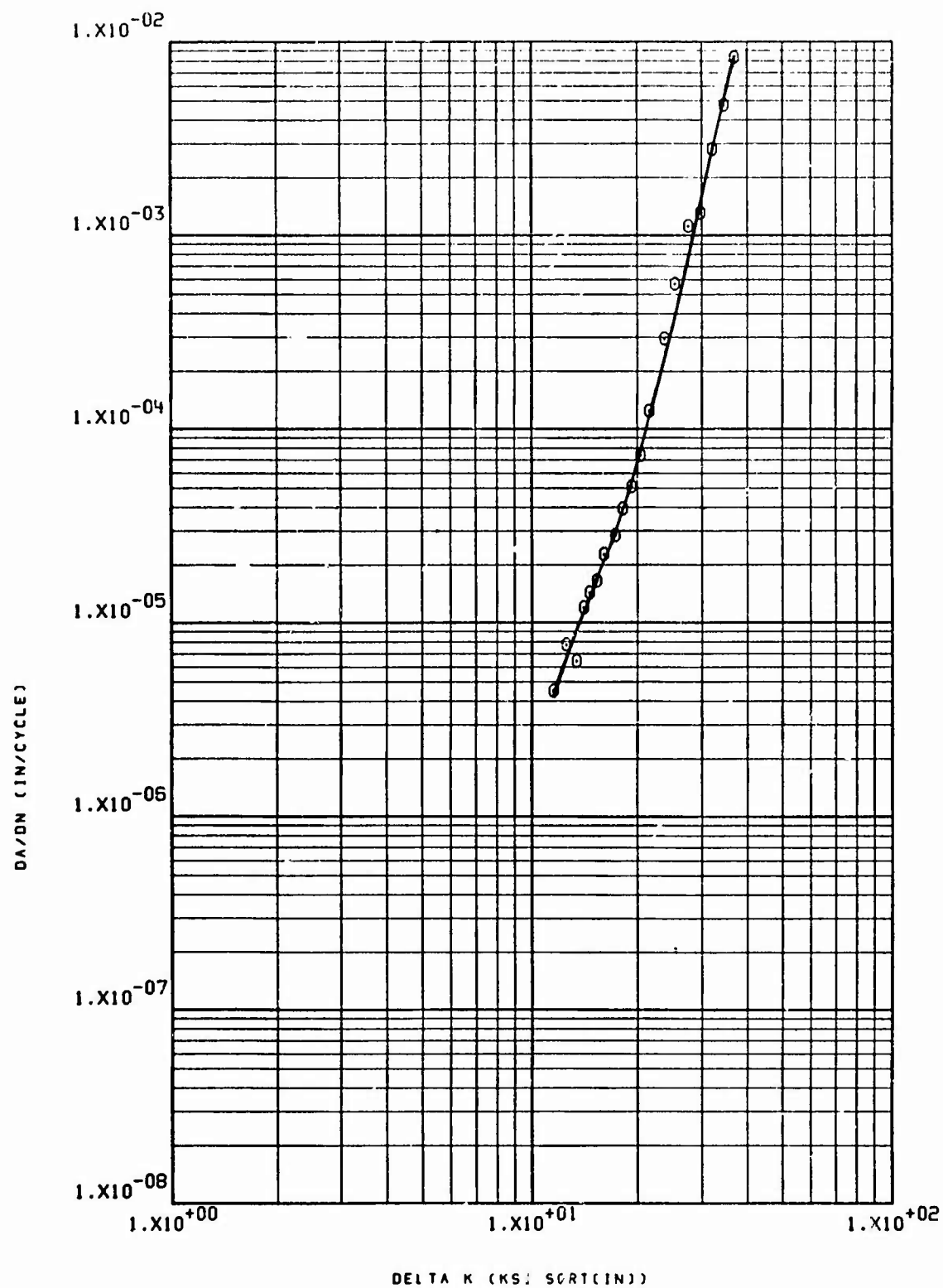
LHA RT R=0.3

60CPH



62 NRW 4-23 T1-6AL-4V DB

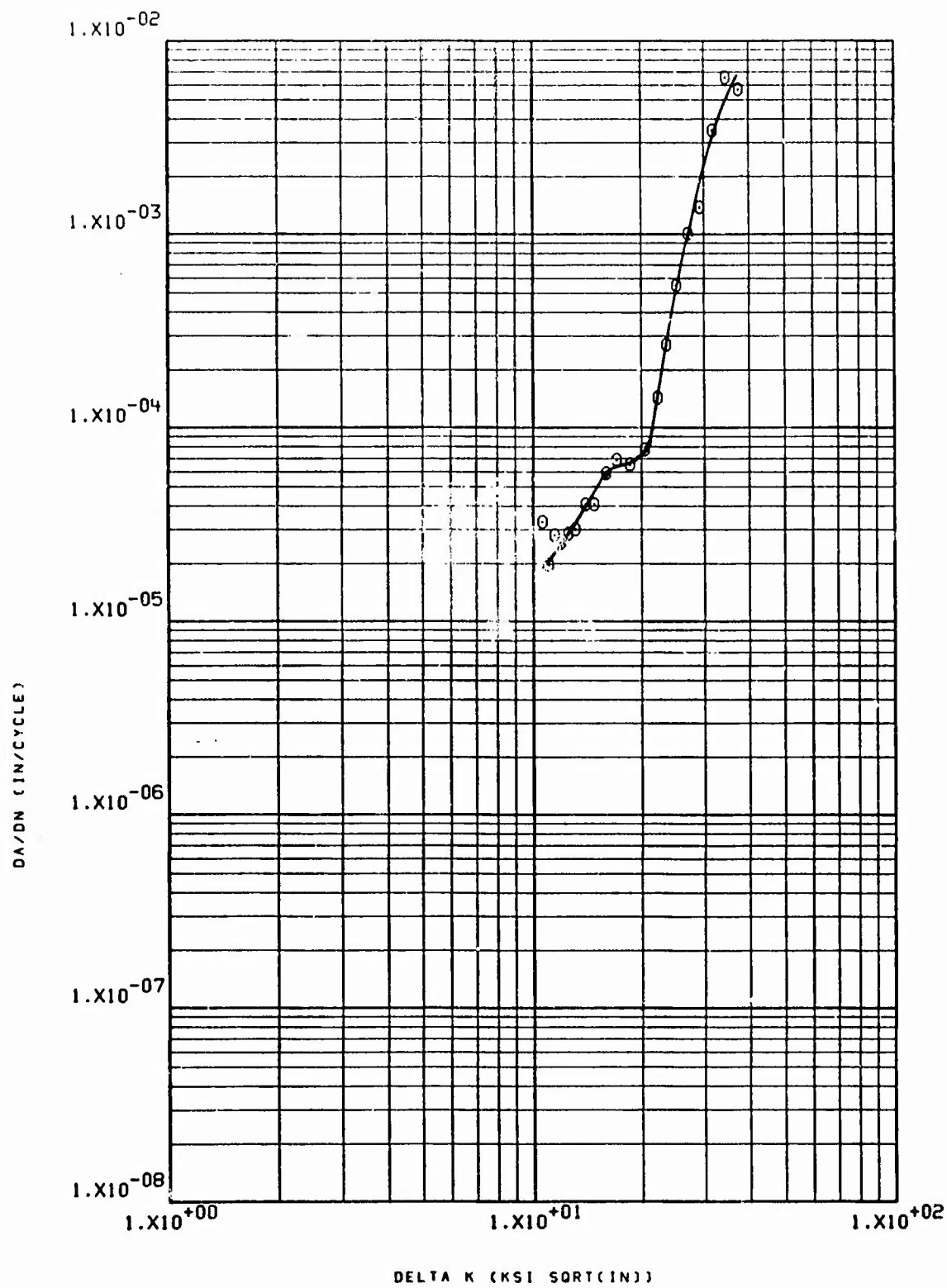
LHA RT R=0.3 1800CPH



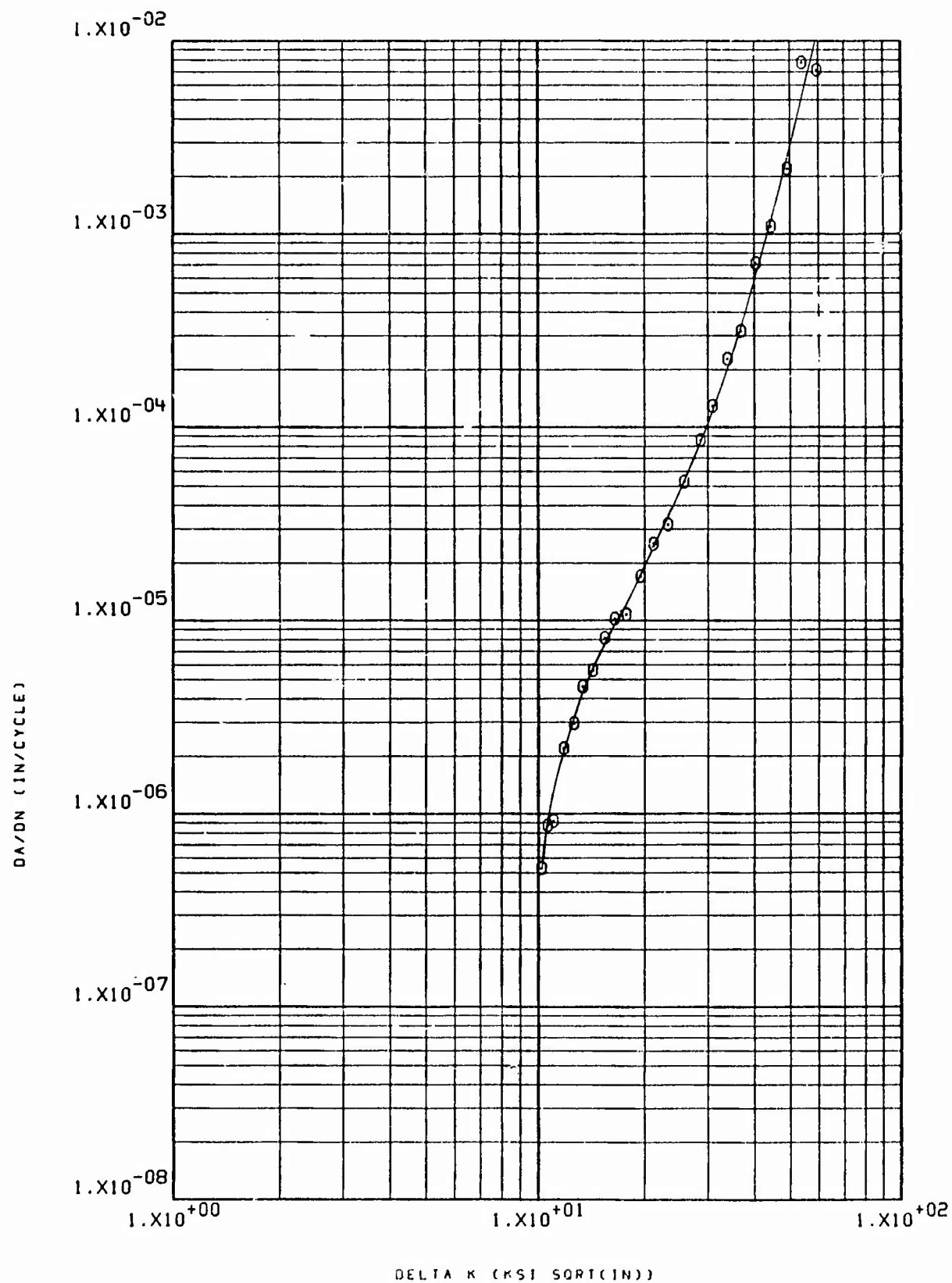
62 NRW 4-32 TI-6AL-4V M.A.

LHA RT R=0.3

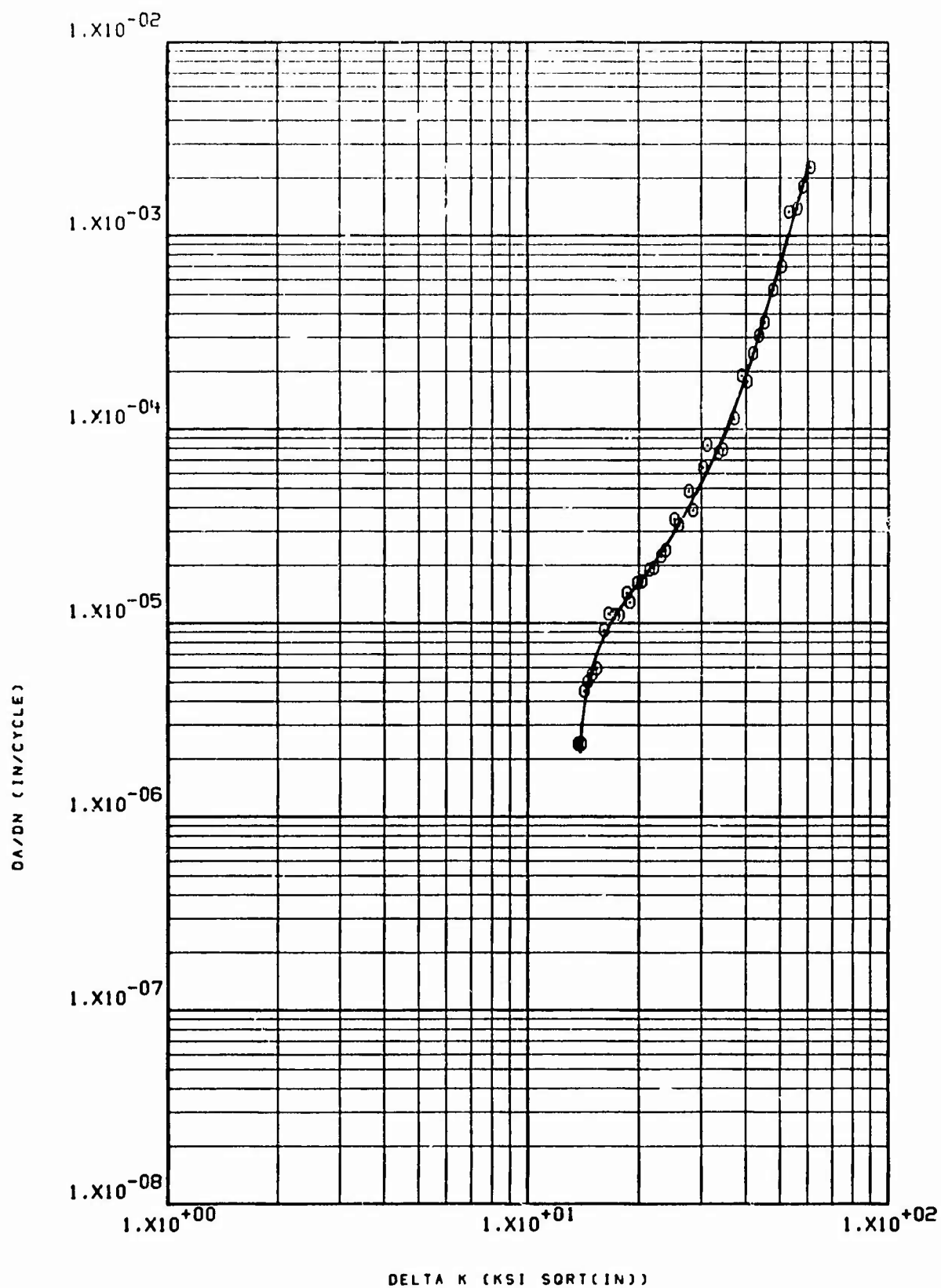
60CPH



62 NRW 4-33 TI-6AL-4V MILL ANN. STW RT R=0.3 60CPH

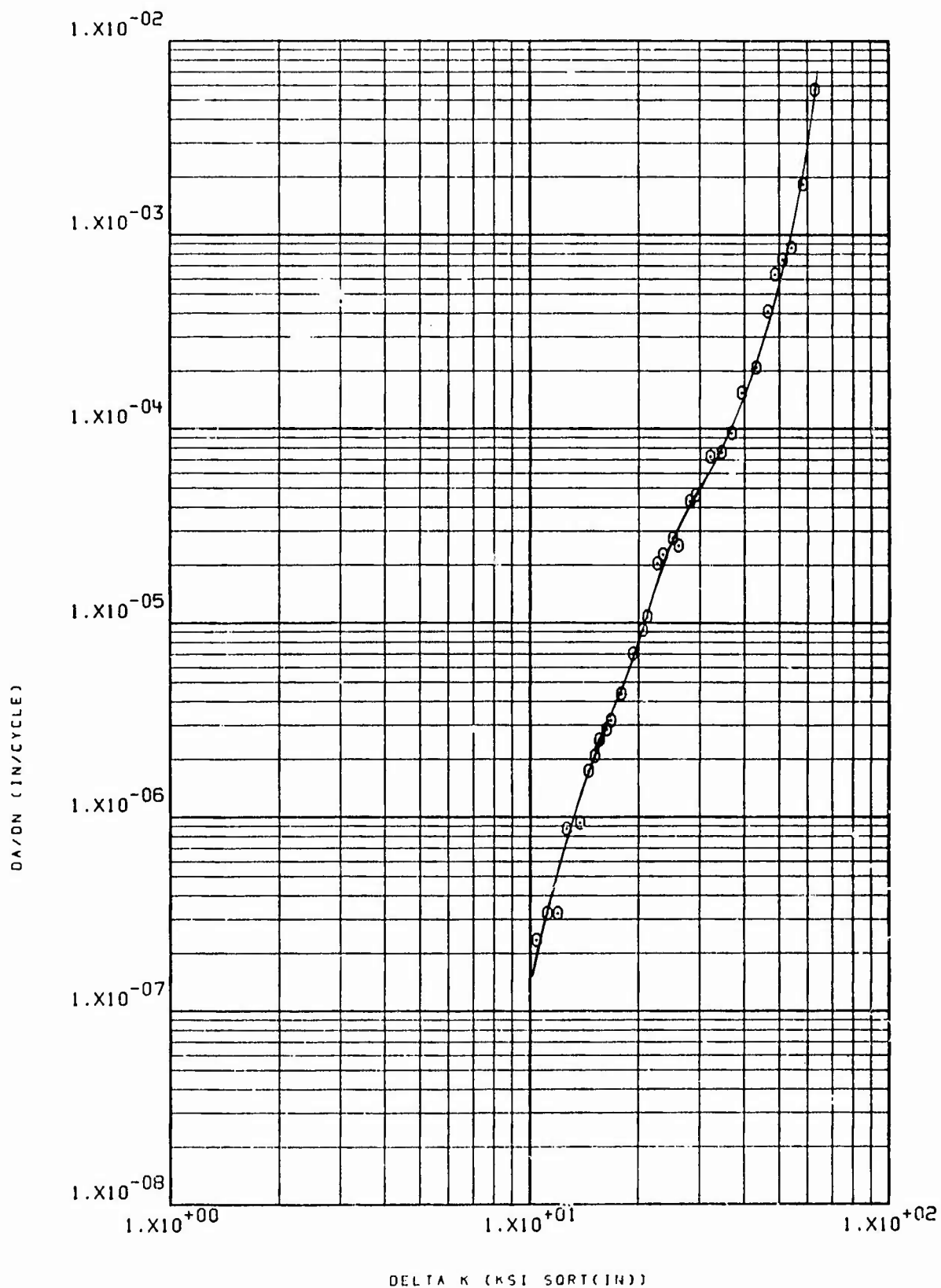


62 NPW 4-34 TI 6AL-4V LMA RT 60CPM R=.3 DBTC

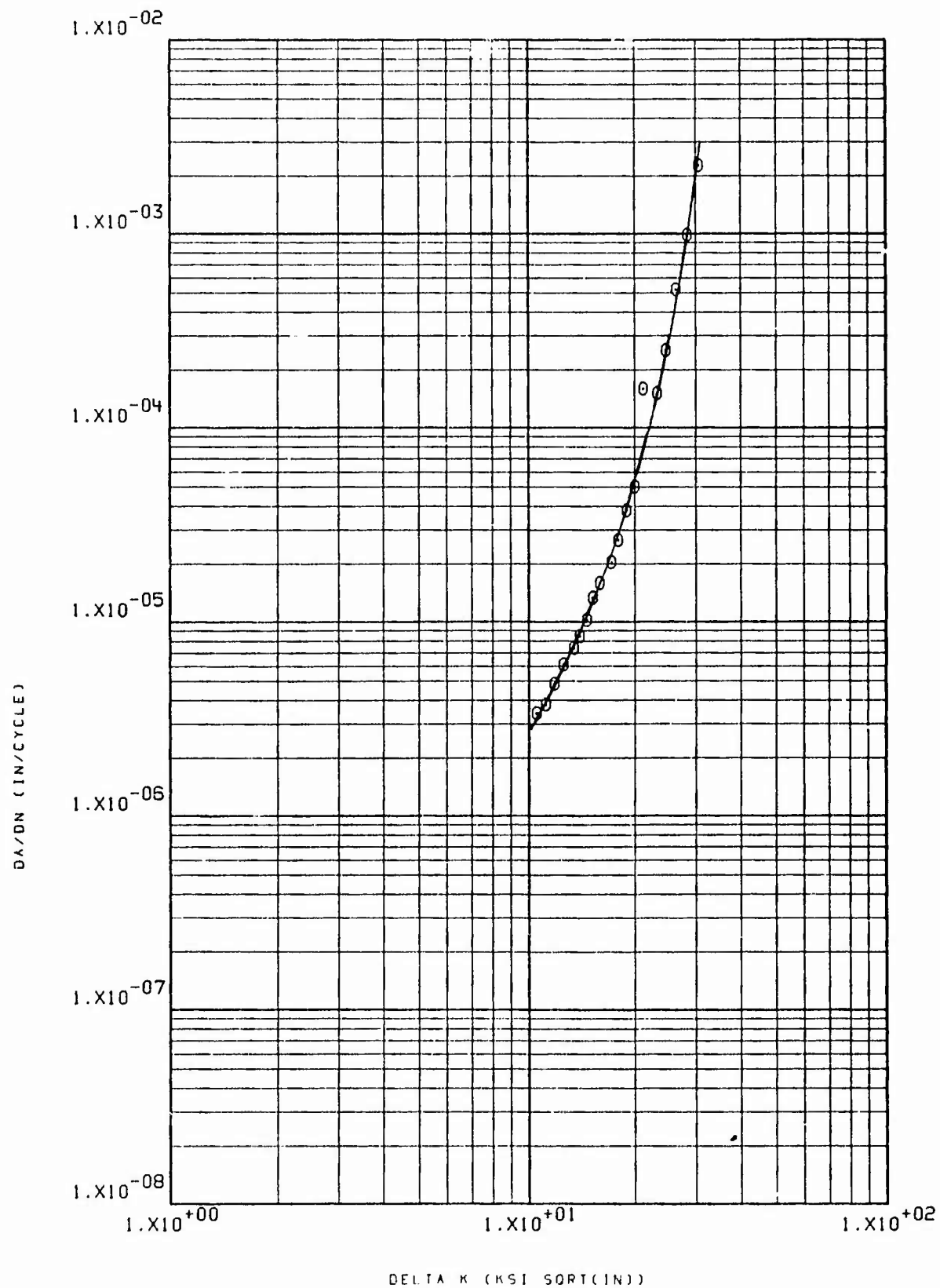


62 NRW 4-271 TI-6AL-4V DETC

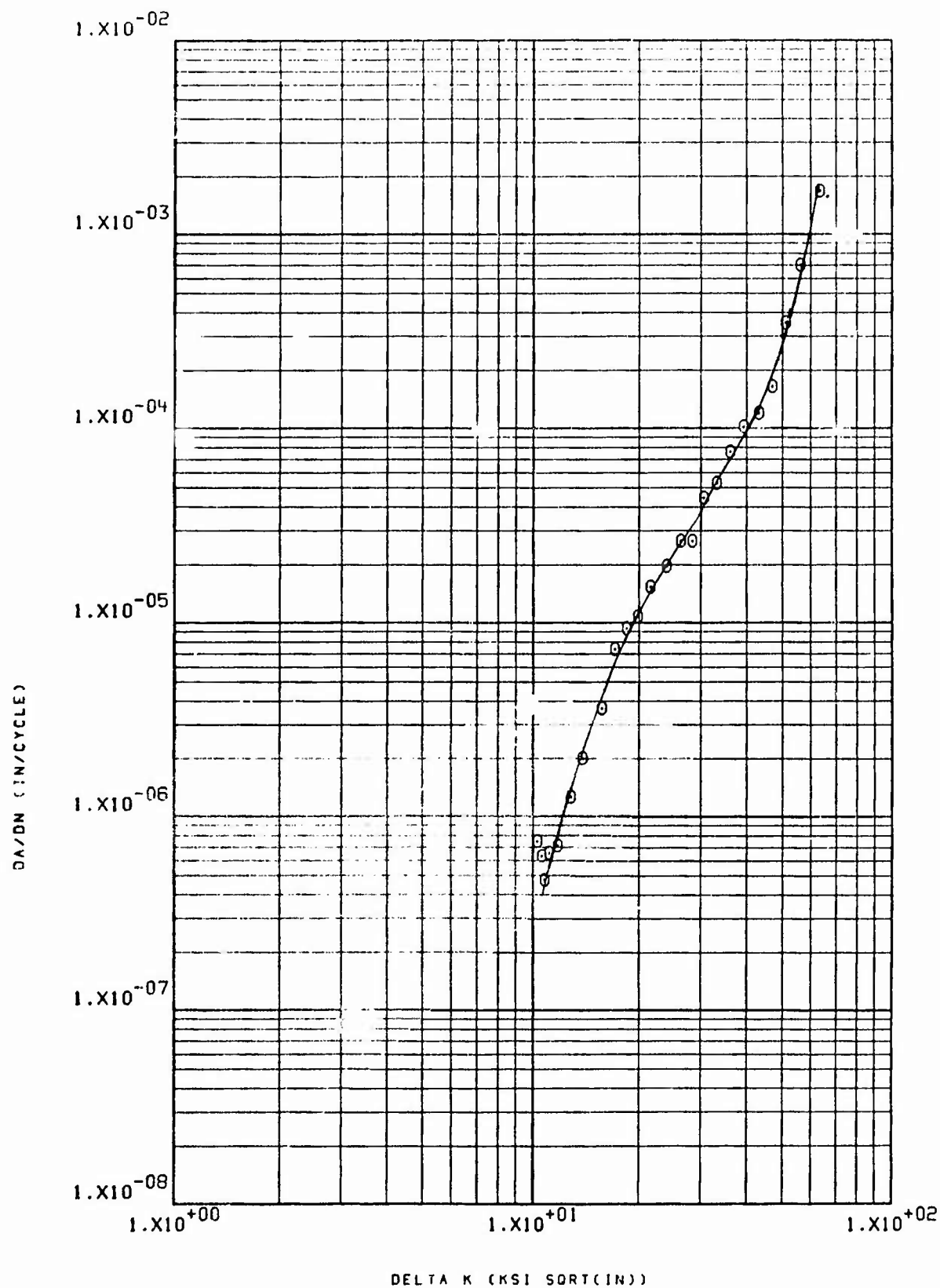
LHA RT R=0.08 60CPM



62 NPW 4 291 T1 GAL 4V BETA ANN LHA RT 60CPM R=.3



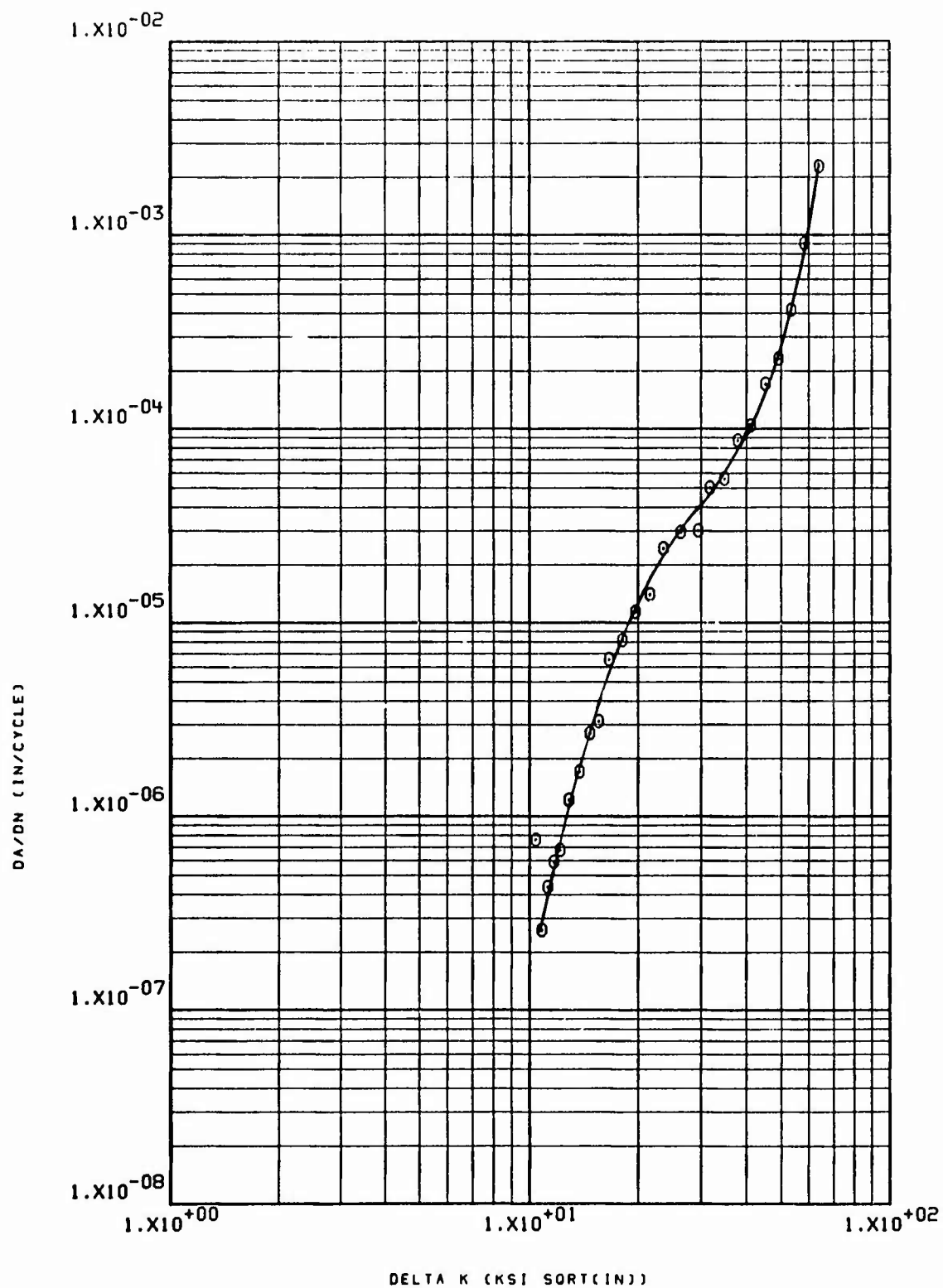
62 NW 4-291 II 6AL-4V 510A L.H.A. R.T. 60CPM R=.3



63 NWR 10-10 T1-6AL-4V DBTC

LHA RT R=0.3

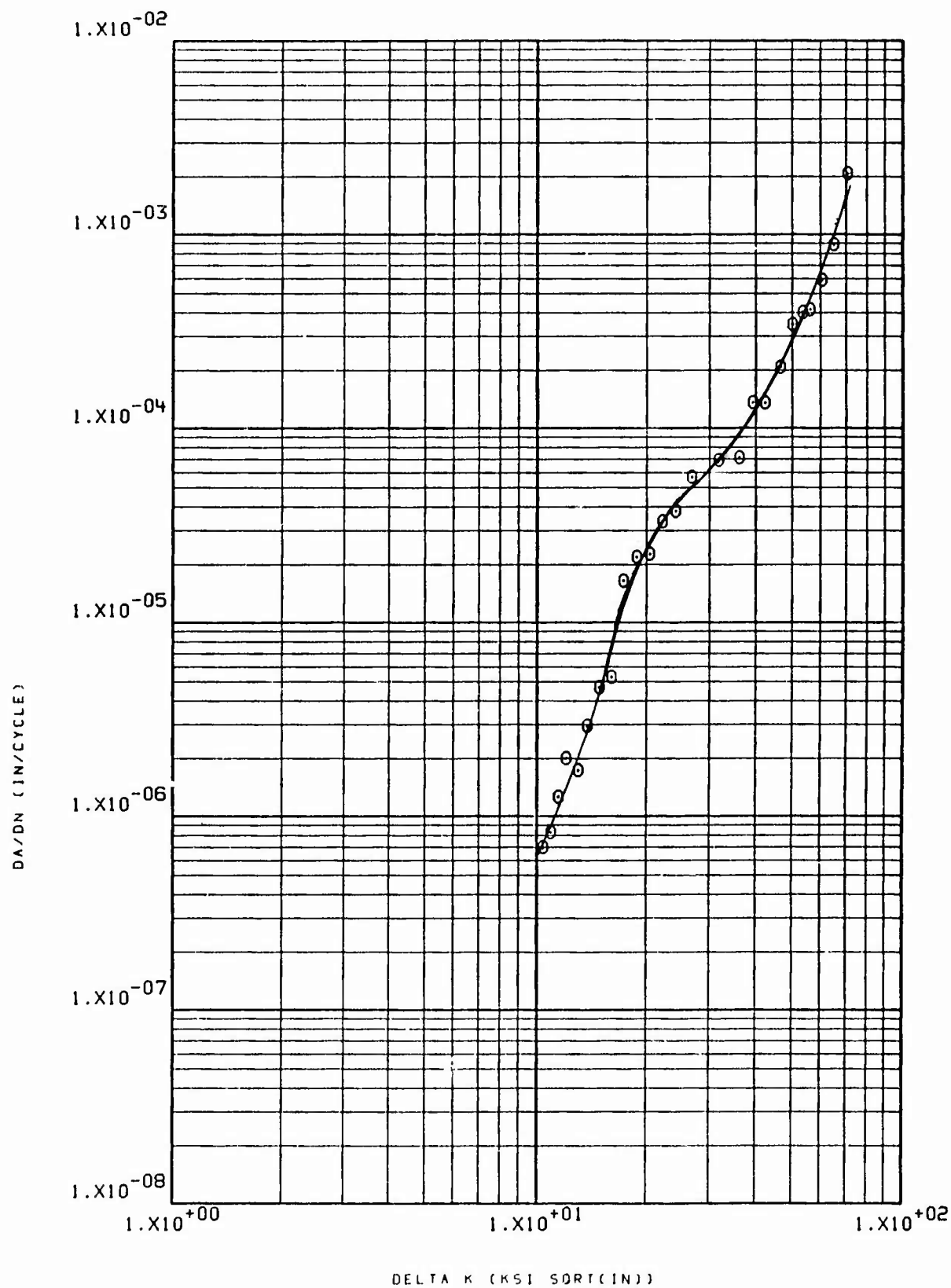
60CPH



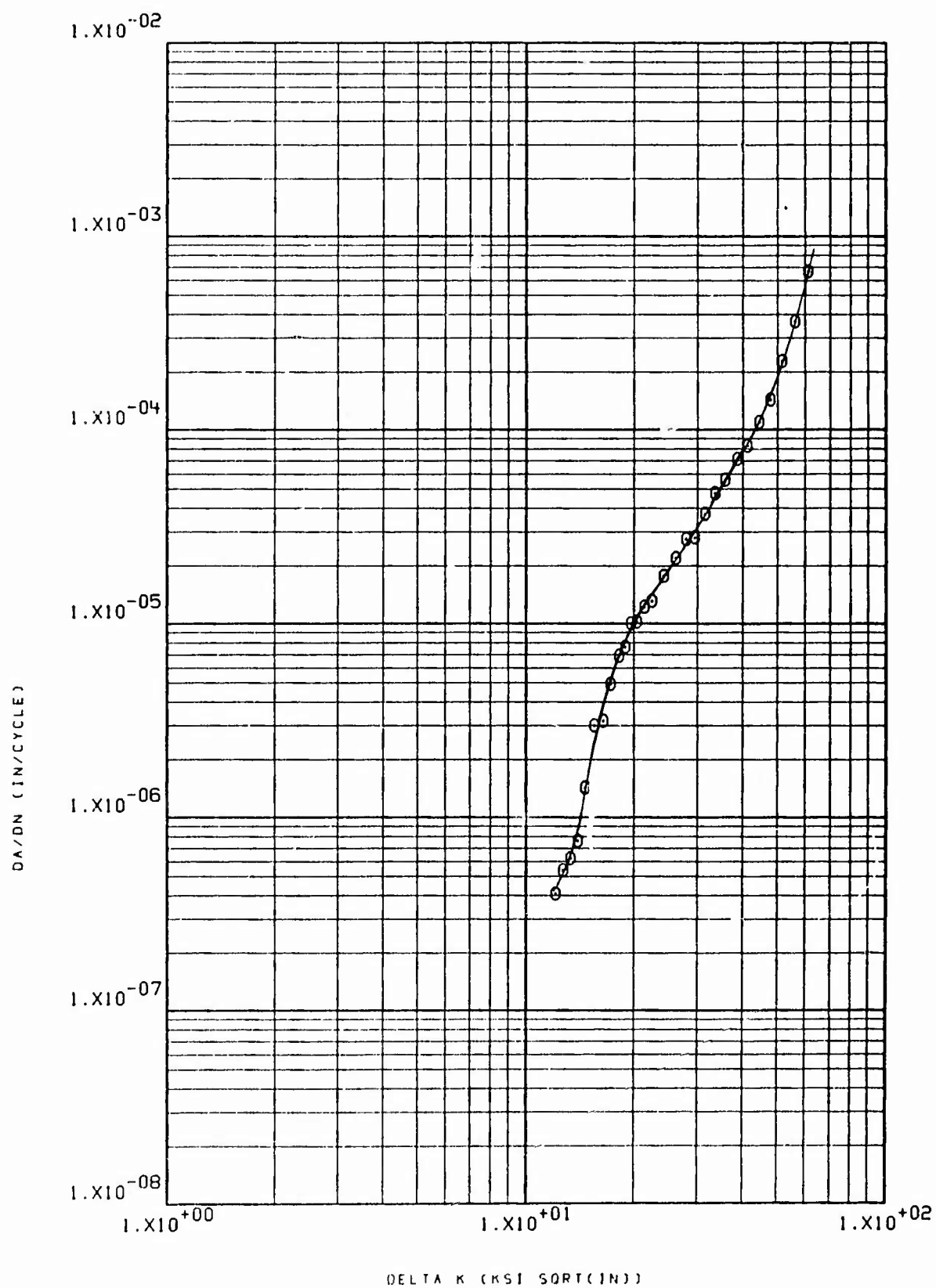
63 NRW 10-12 T1-6AL-4V DETC

LHA RT R=0.3

60CPM

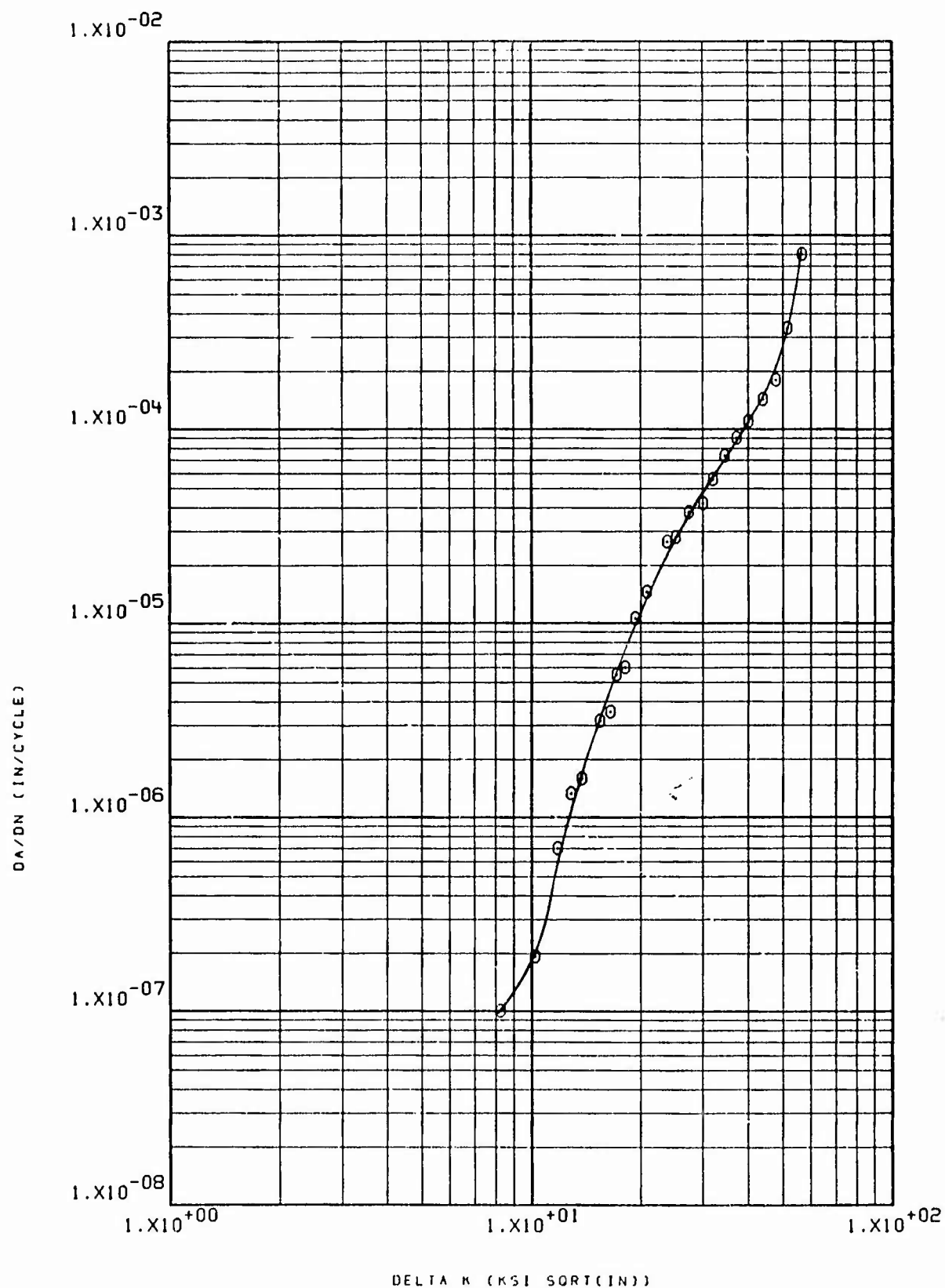


63 NPW 10-14 TI GAL 4V SUMP RT 60CPM R=.3 DBTC



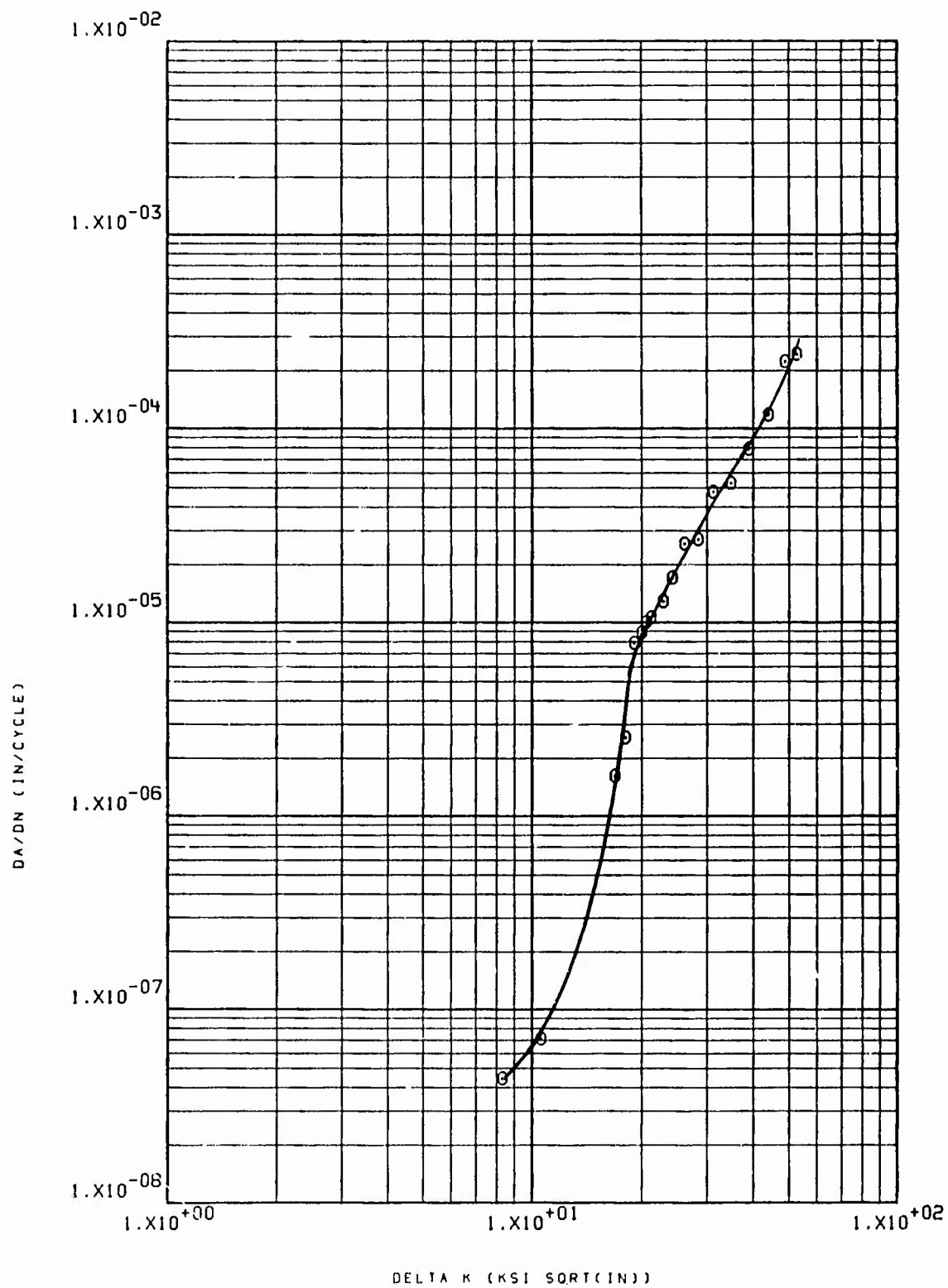
64 NPS 11-7 T1 CAL 4V

MA 10A RT 360CPH R=08



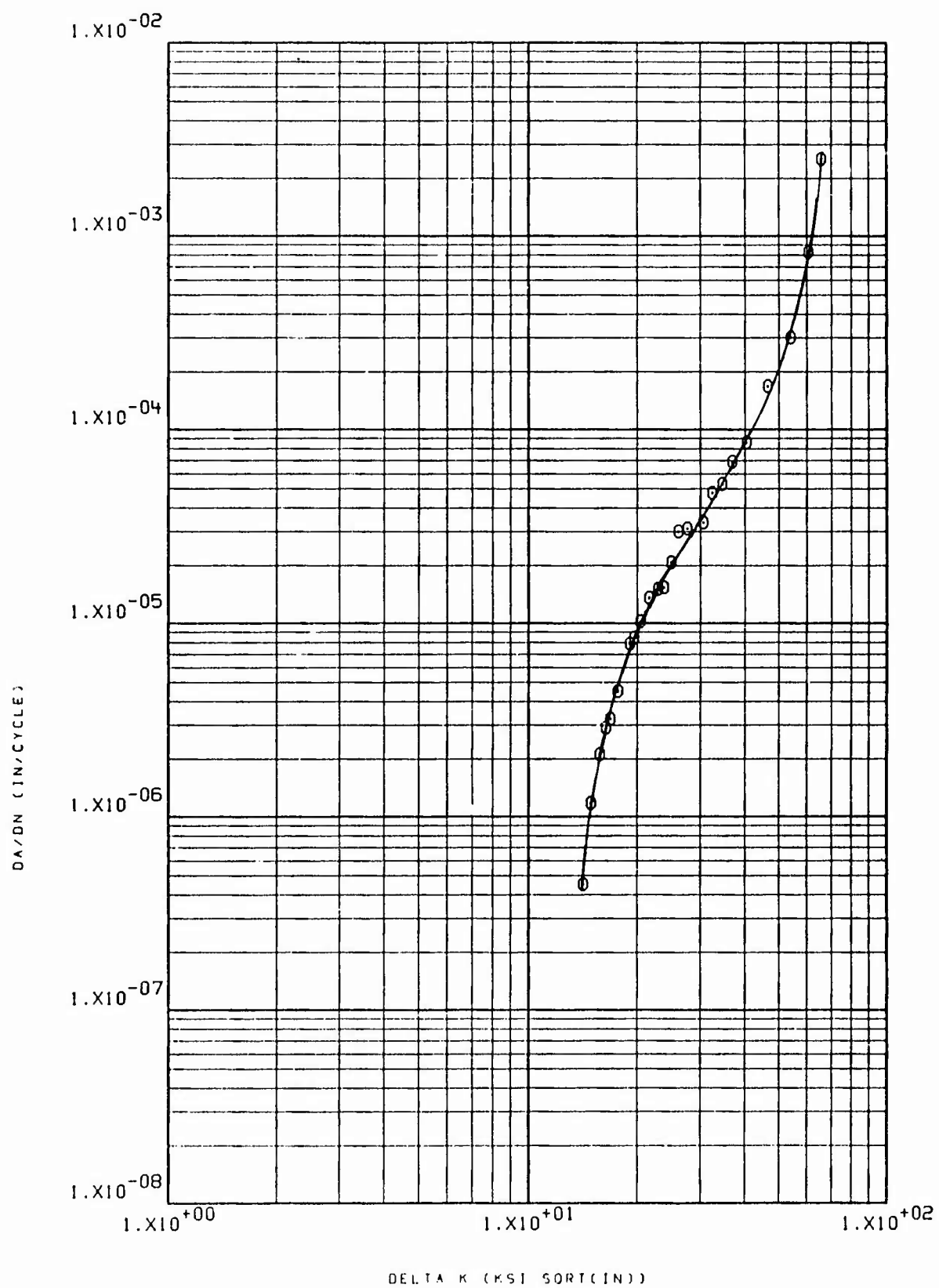
64 NPW 11-8 TI-6AL-4V MA

SUMP RT 60CPH R=.08



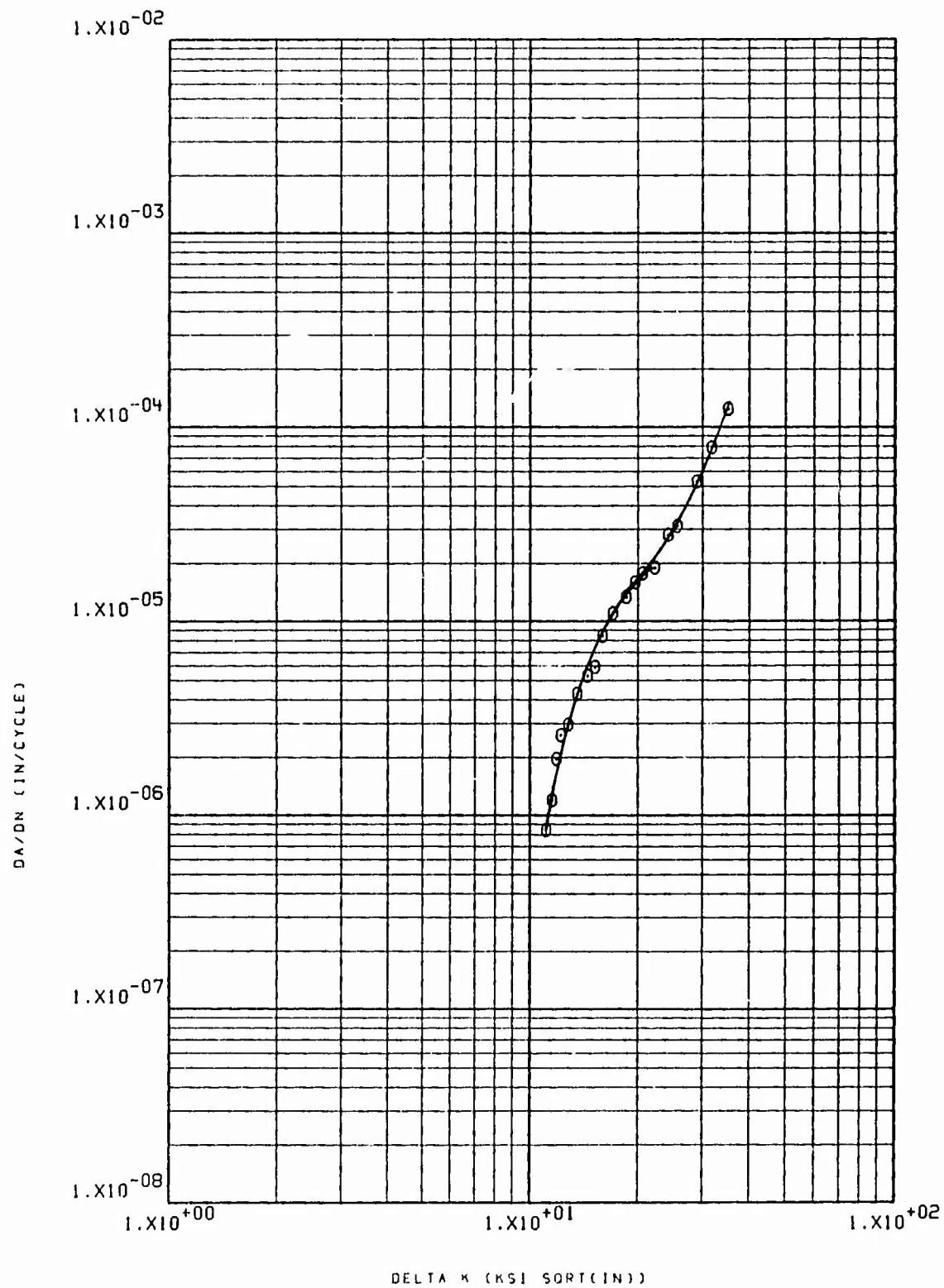
64 NPW 11-9 II 6AL-4V MA JP4

R.T. 60CPM R=.08



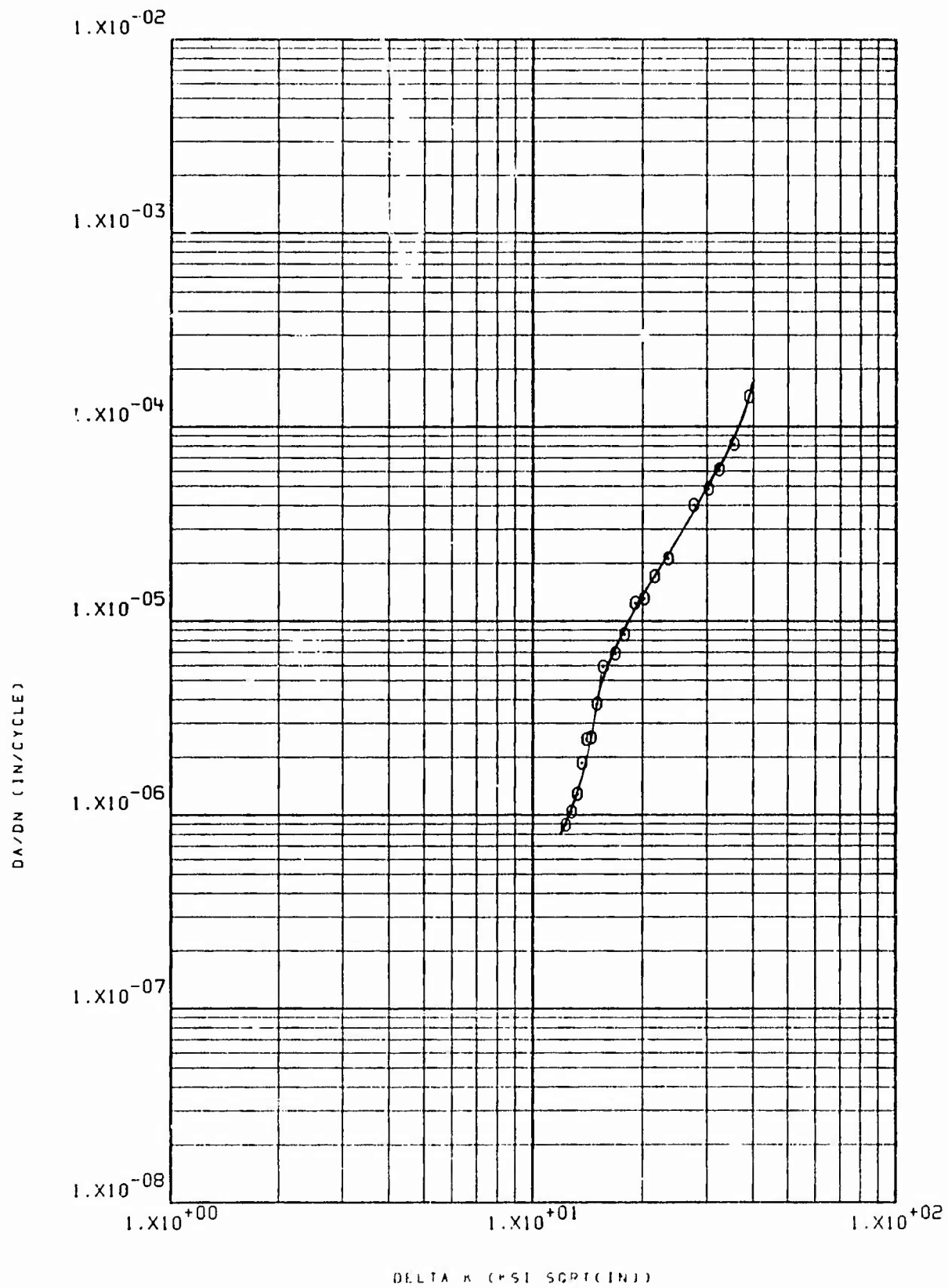
64 NP# 11 10 11 6AL 4V

MA LHA R.T. 60CPH R-08



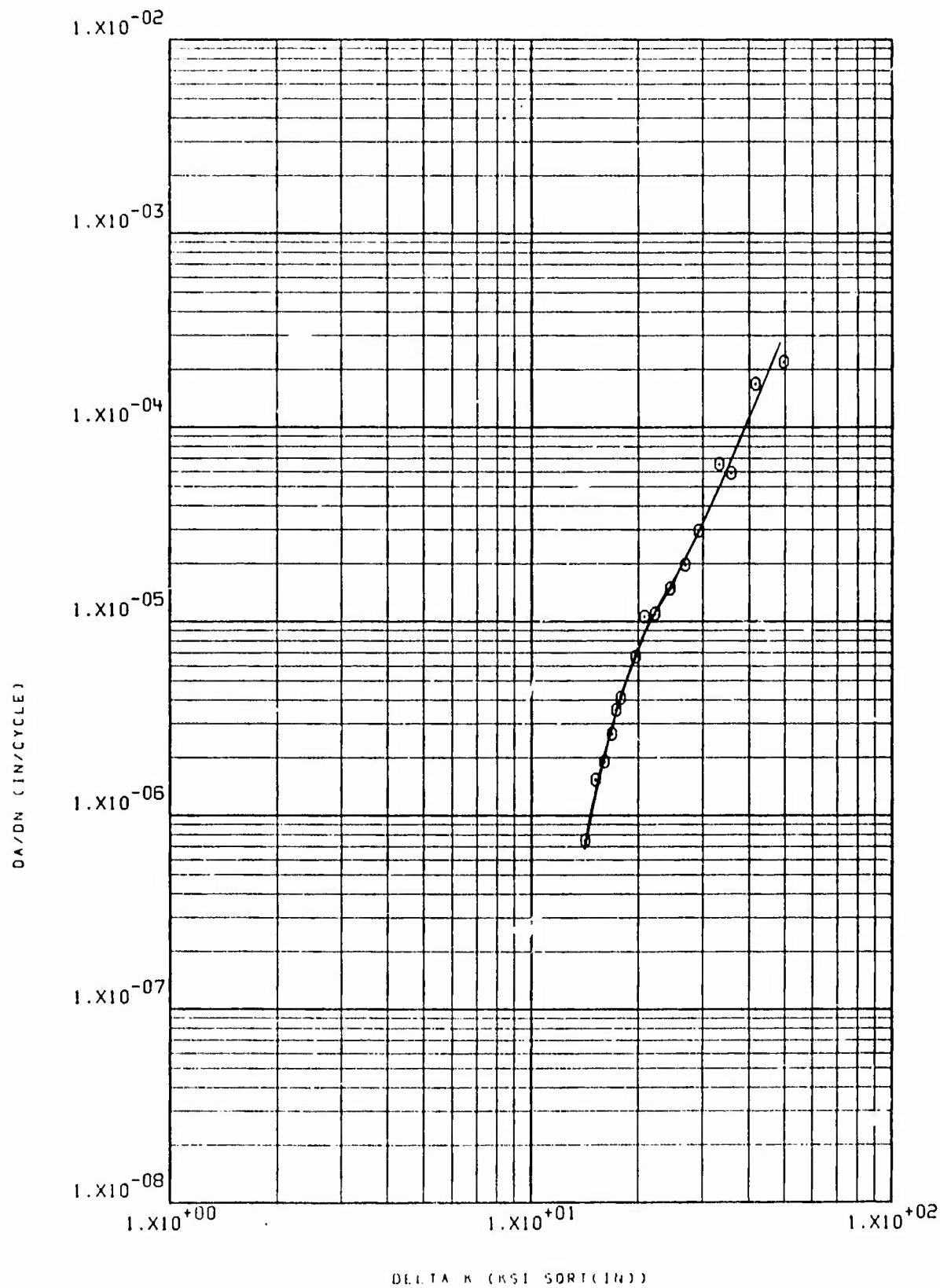
64 NPW 11-11 TI 6AL-4V

MA LHA R.T. 360CPM R=.5



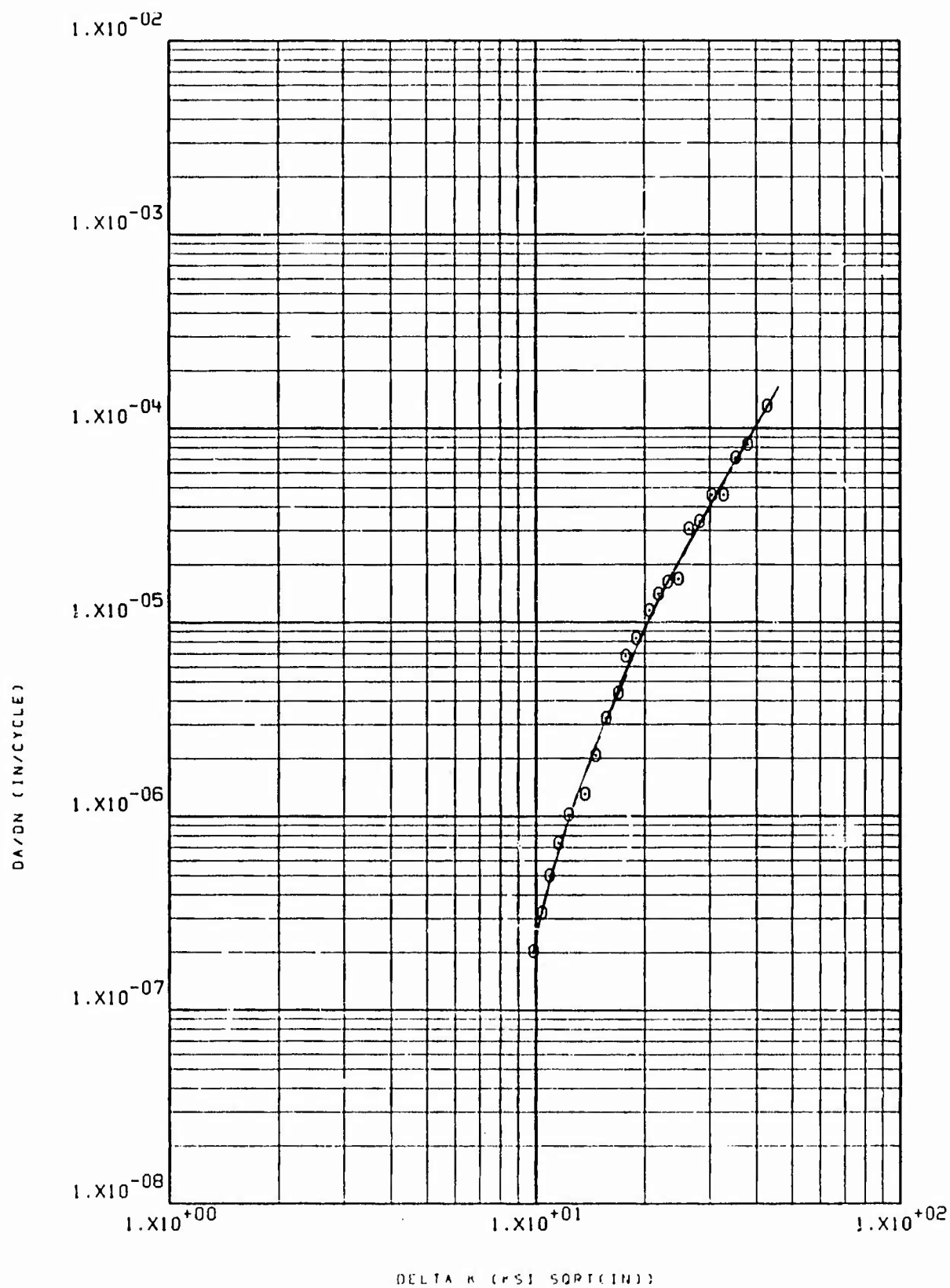
64 54 11-12 11 CAL 4V

HA LHA RT 060PM P 1.3



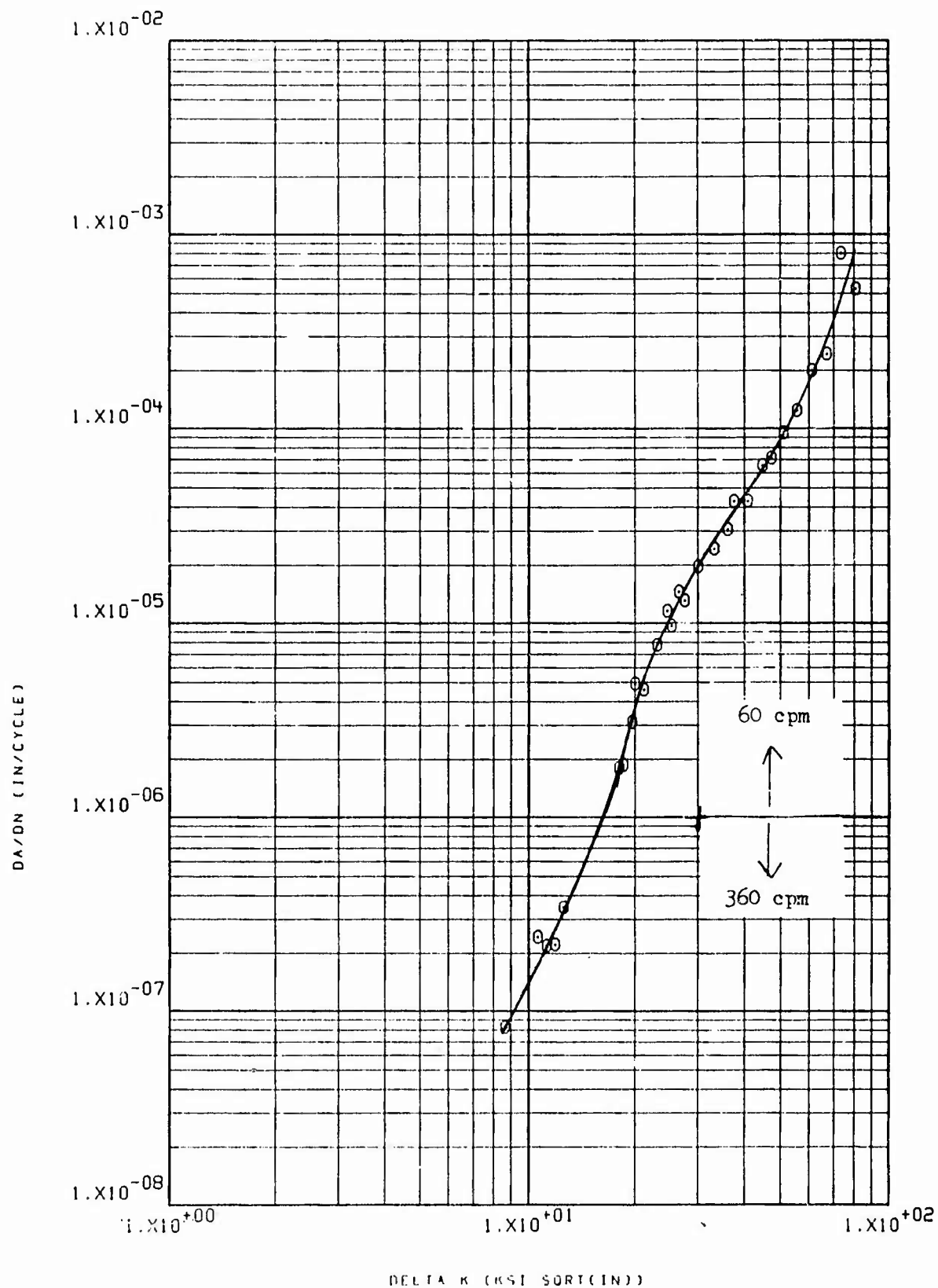
0.4 INP 11 13 11 6A1 4V

HA LHA P.T. 300CPH R .08



64 NWP 11-14 TI 6AL 4V

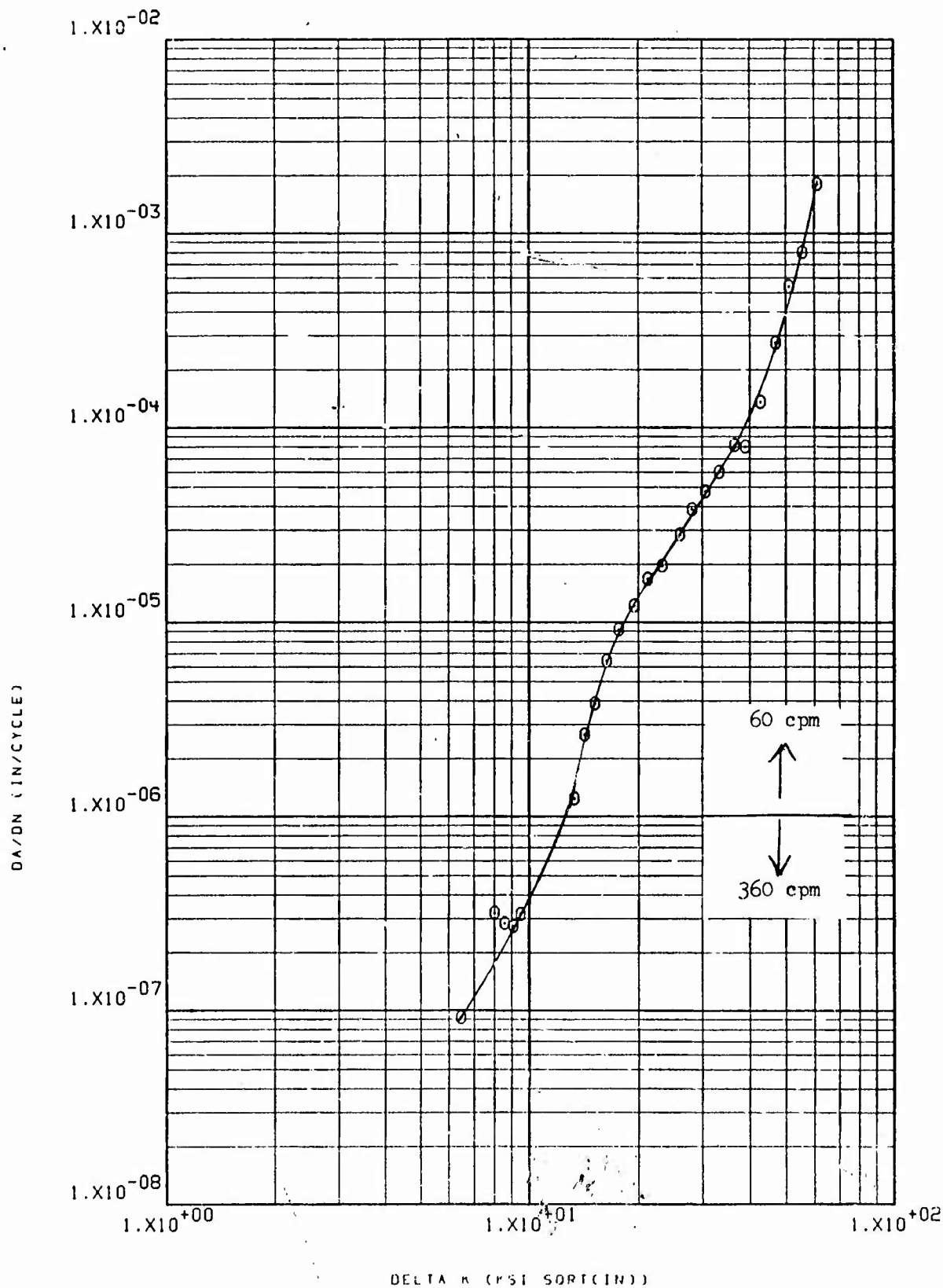
HA CORR PT 600PH R 0.08



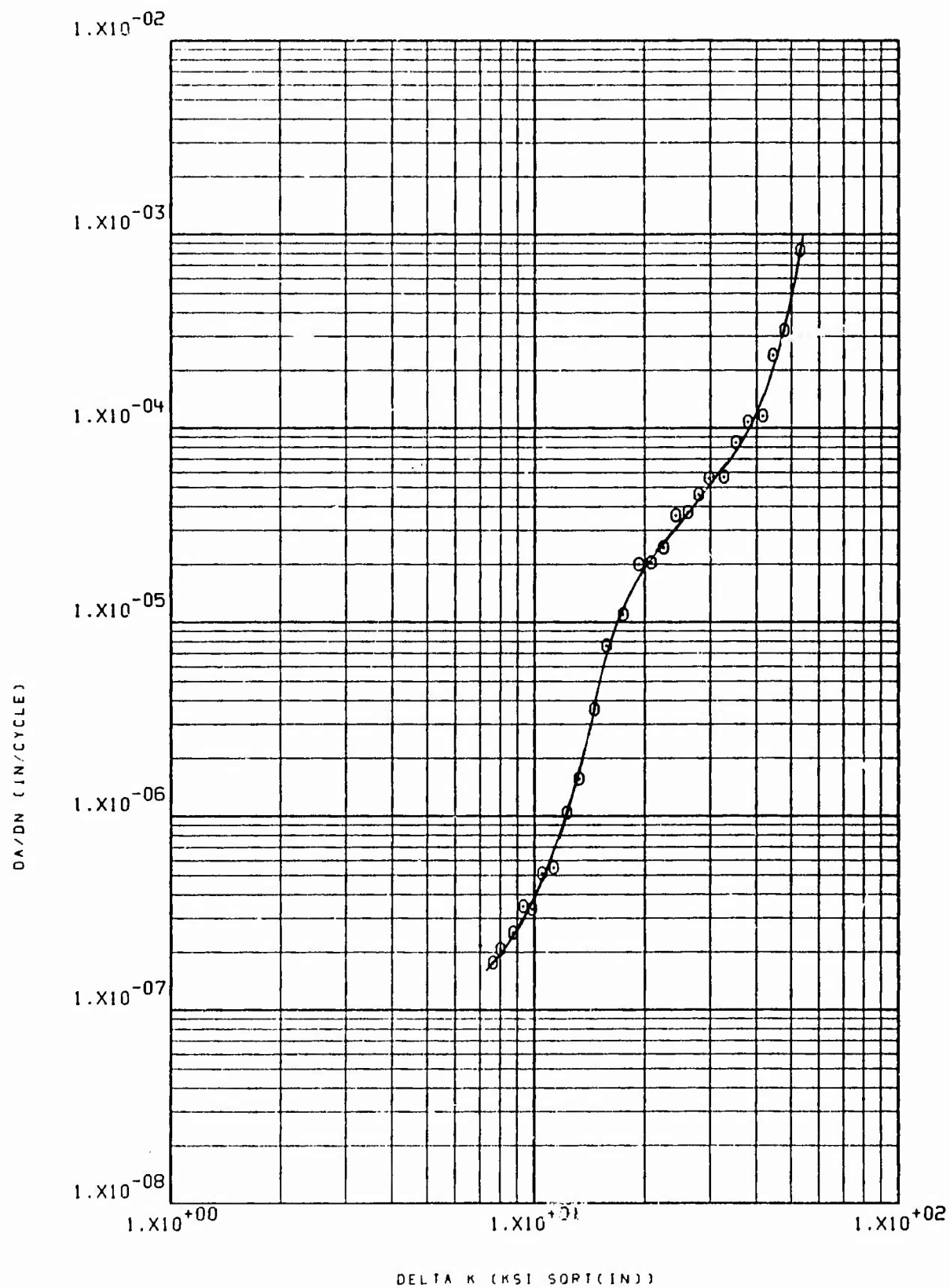
0.6 MP 16 1 11 6AL-4V MA

L.H.A.

P.1. 60 D 360 CPM R=.3



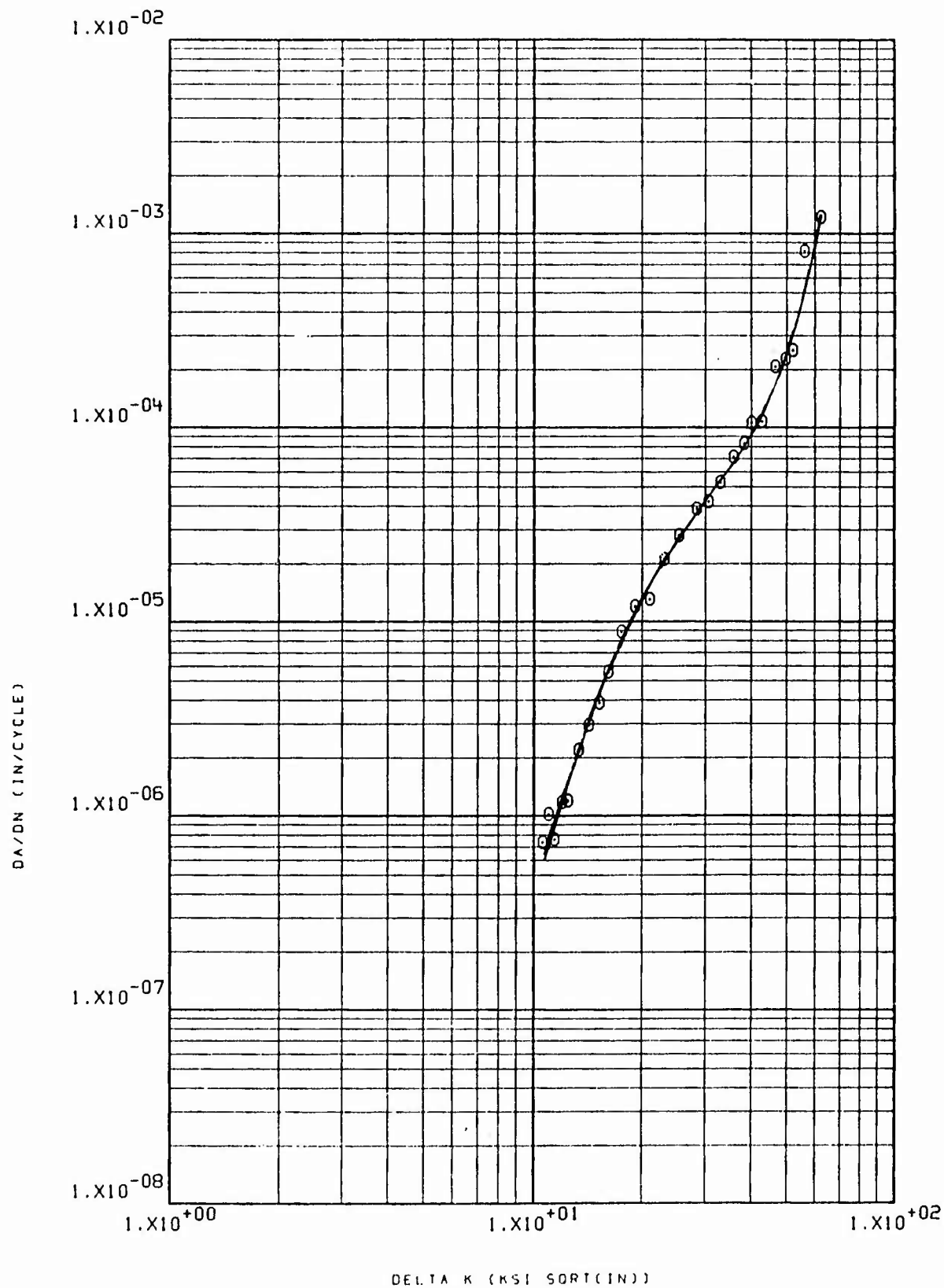
66 HPA 16-3 T1 GAL-4V MA L.H.A. P.T. 600360CPM R.L.J

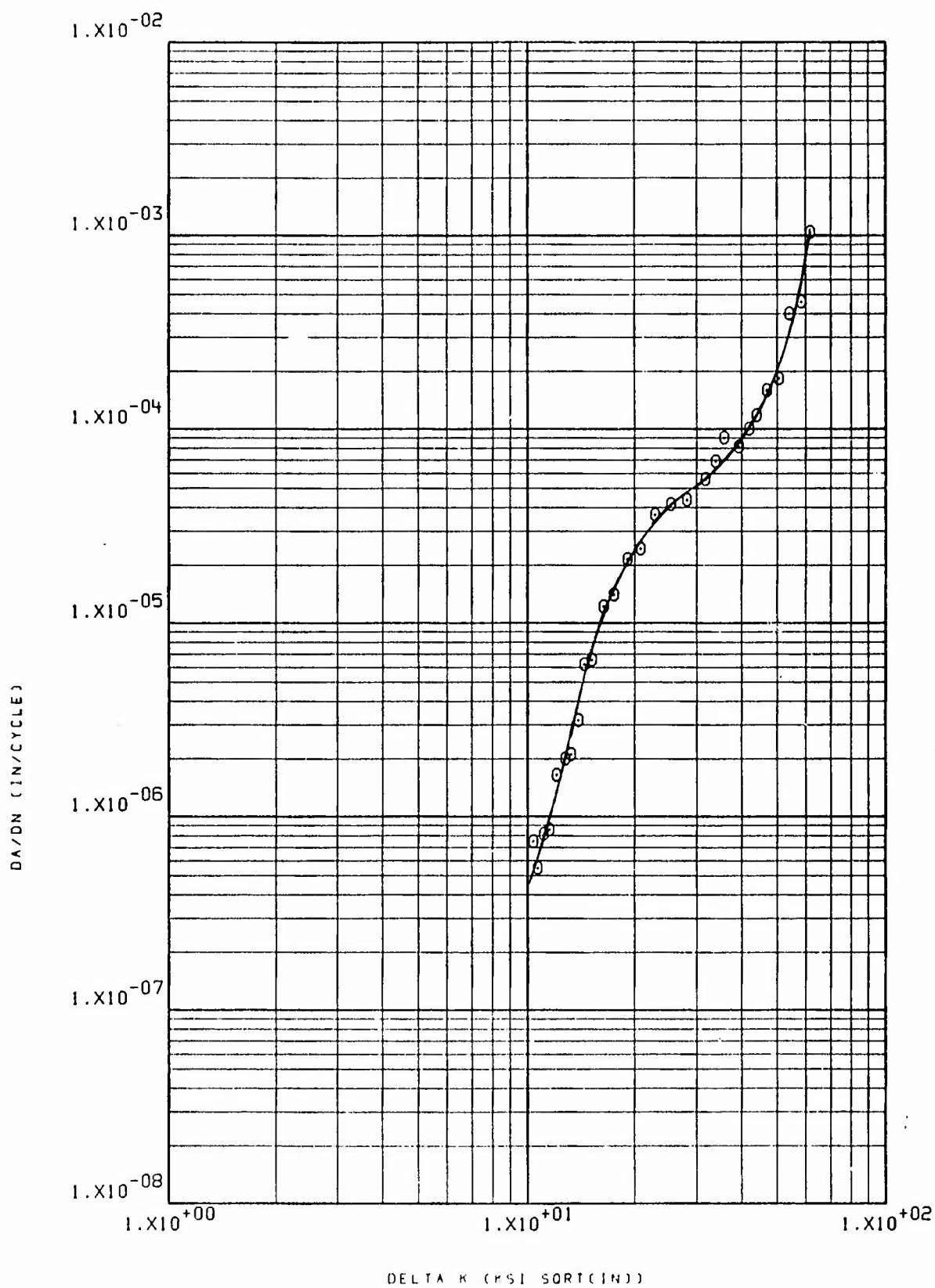


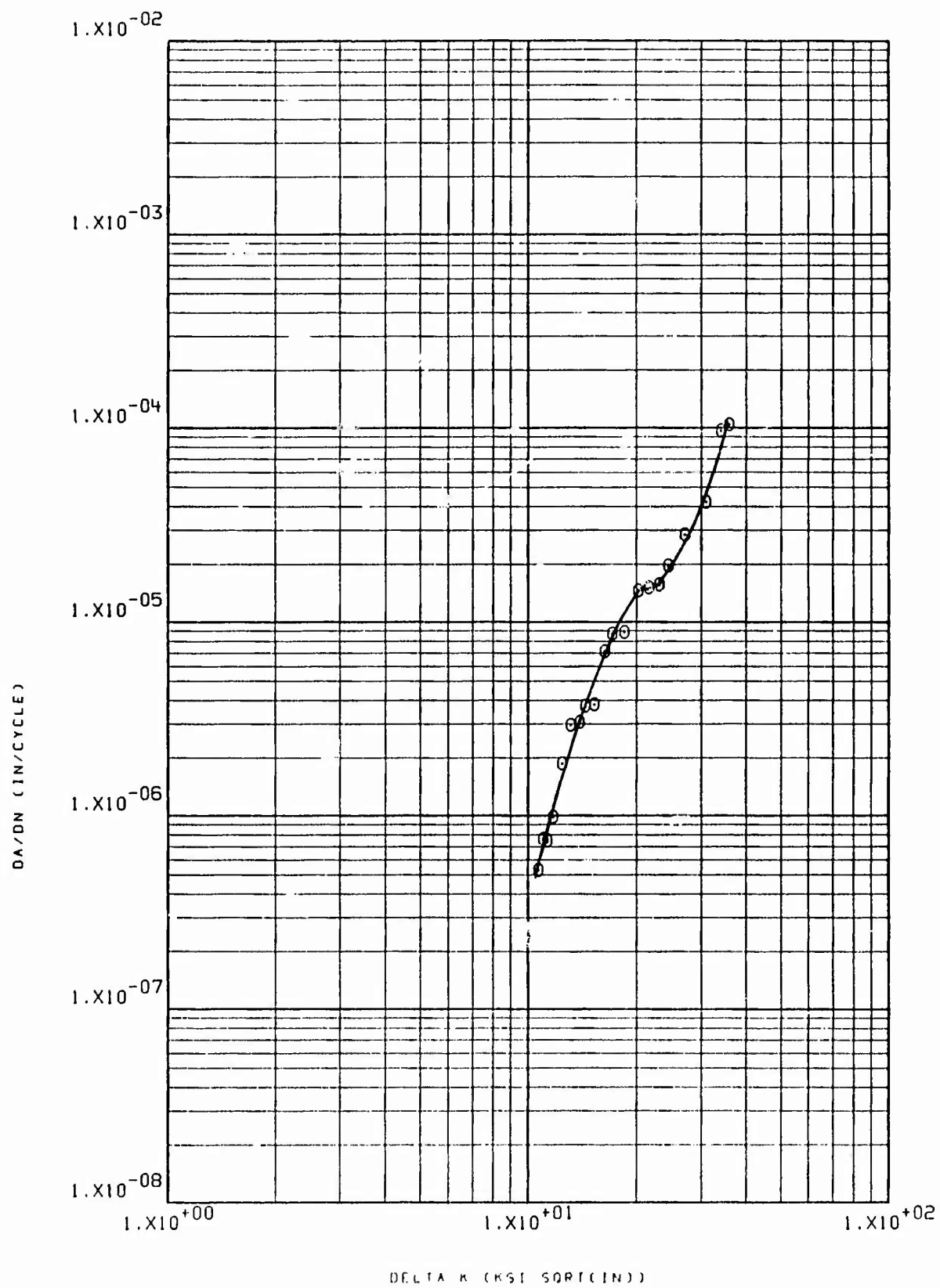
66 NPW 16 4 T1 6AL-4V HA

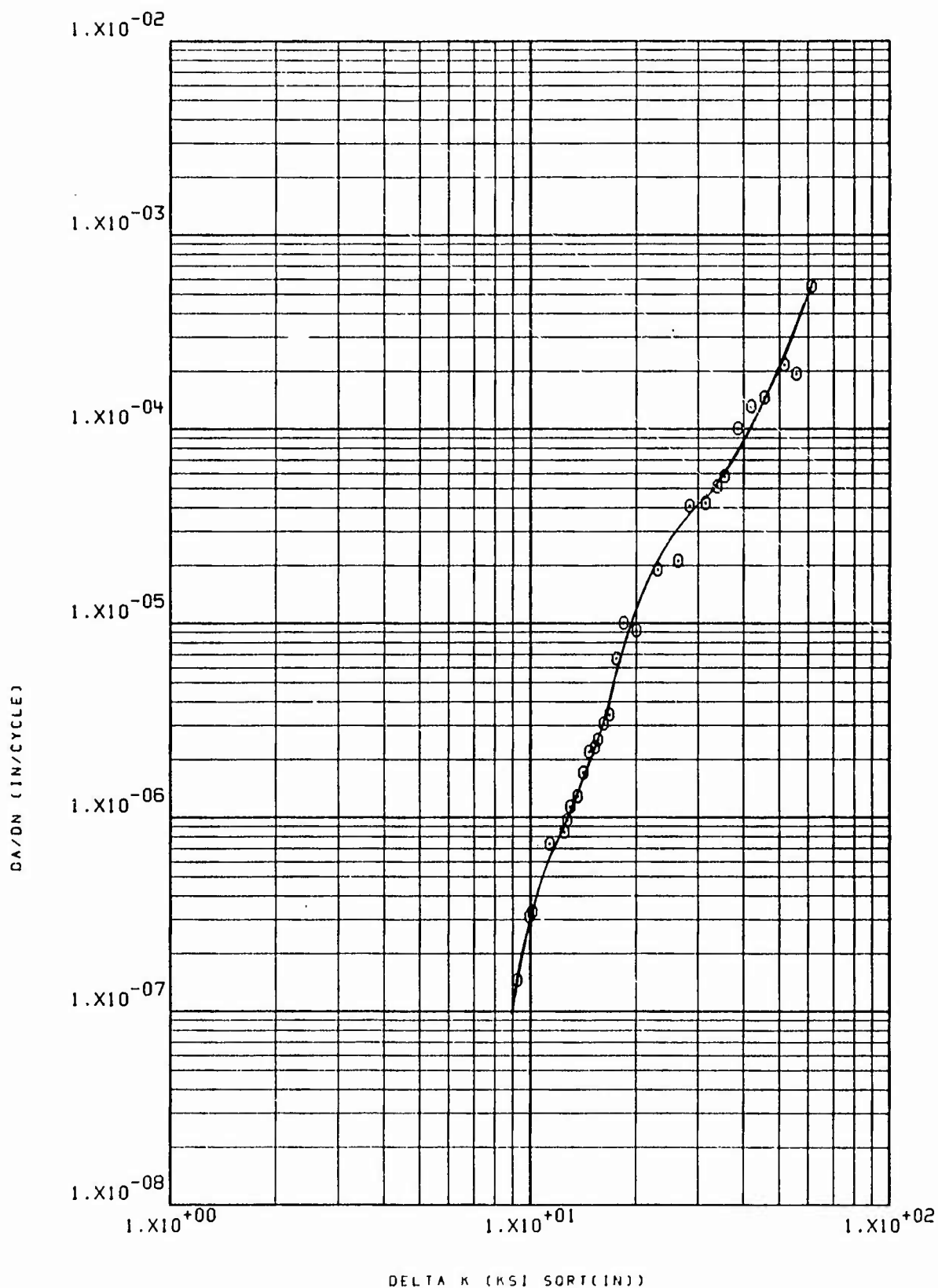
SUMP

R.T. 60CPH R=.3



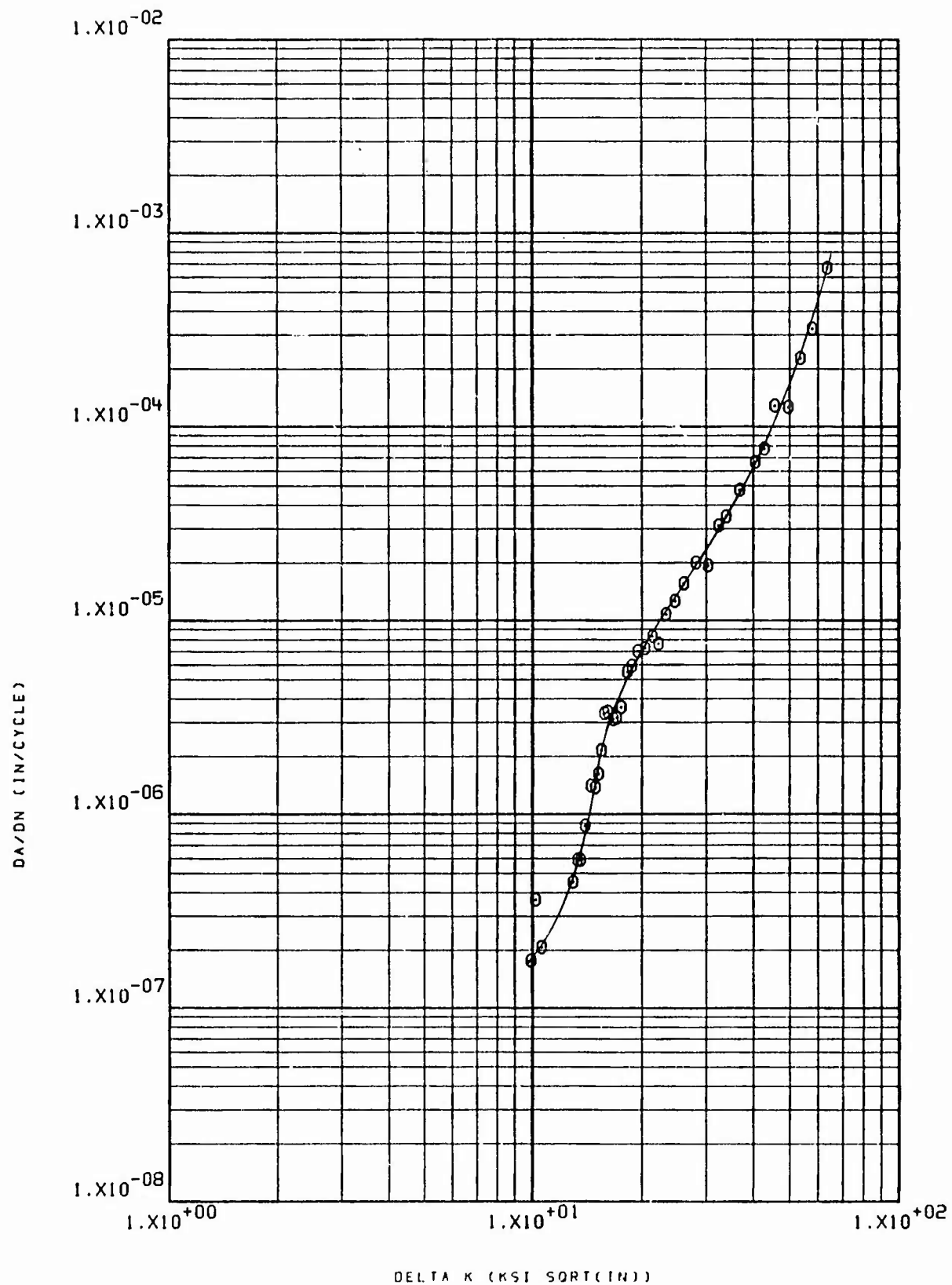




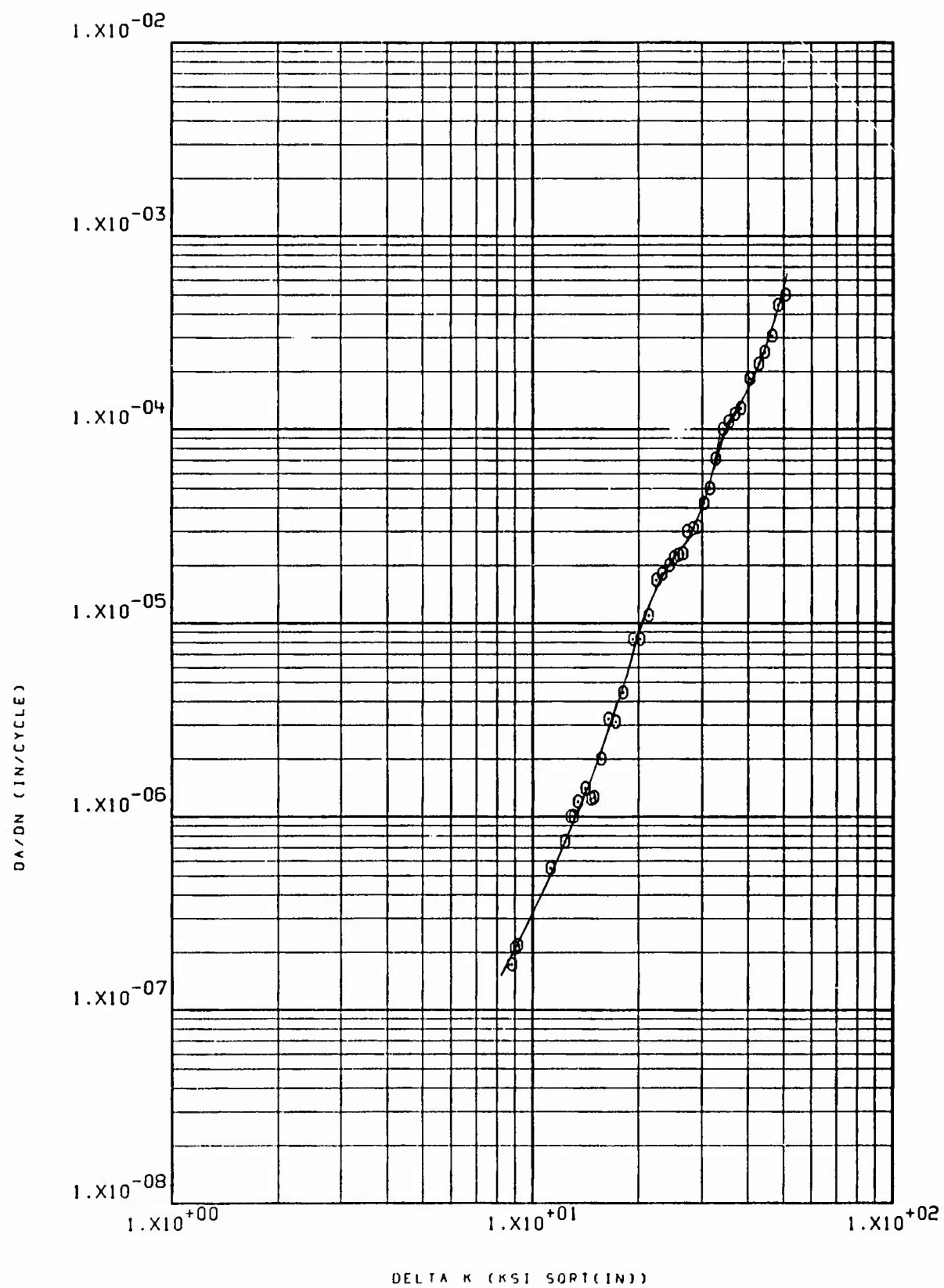


67 NWP 29-2 11 GAL-4V DBTC

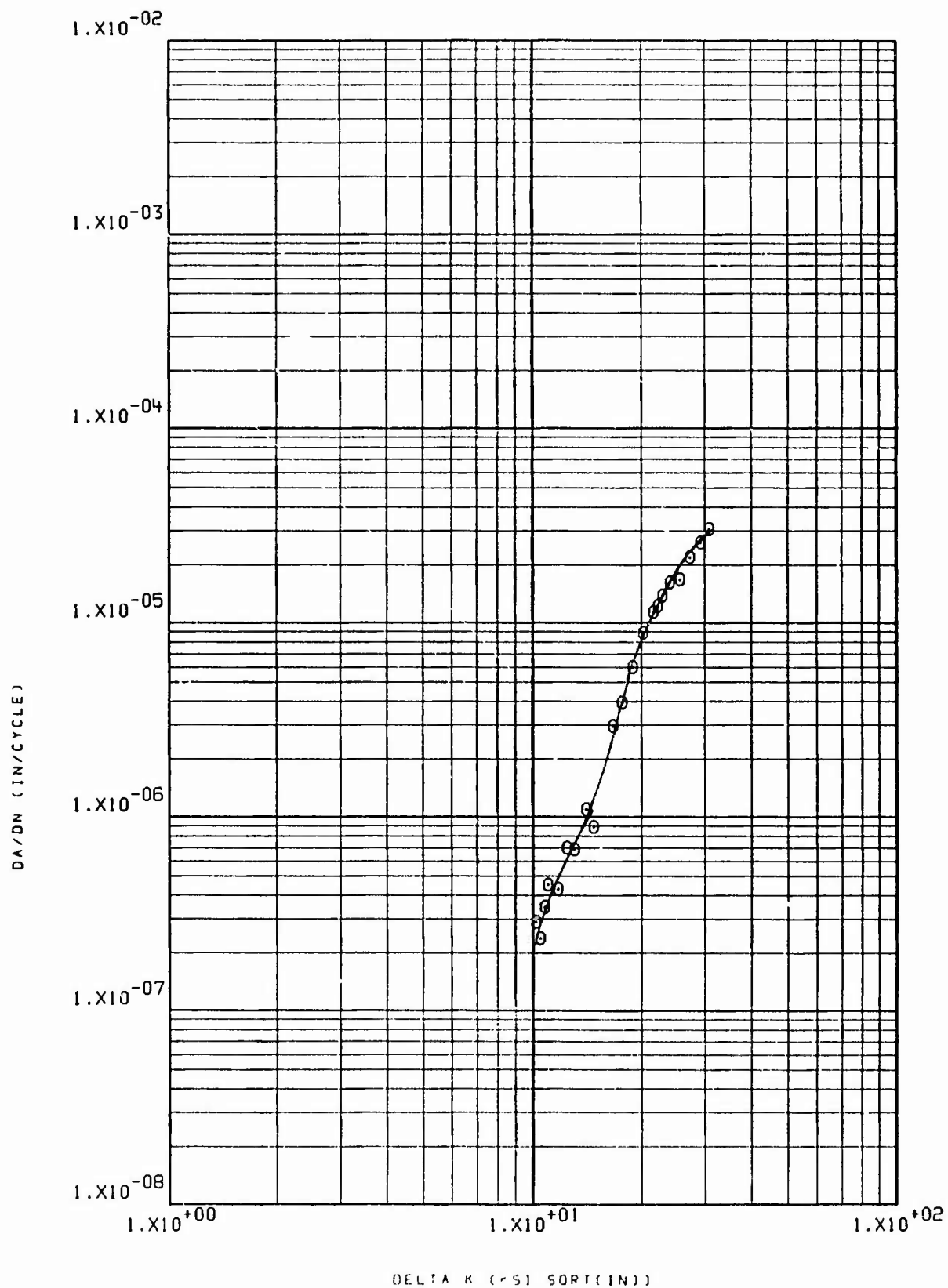
SUMP 60CPH P.T. R=08



67 NWP 29-3 TI 6AL-4V DBTC LNA RT R=.09 60CPH



67 HAP 29-4 11 BAL-4V RA SUMP PT 60CPH R=0.08

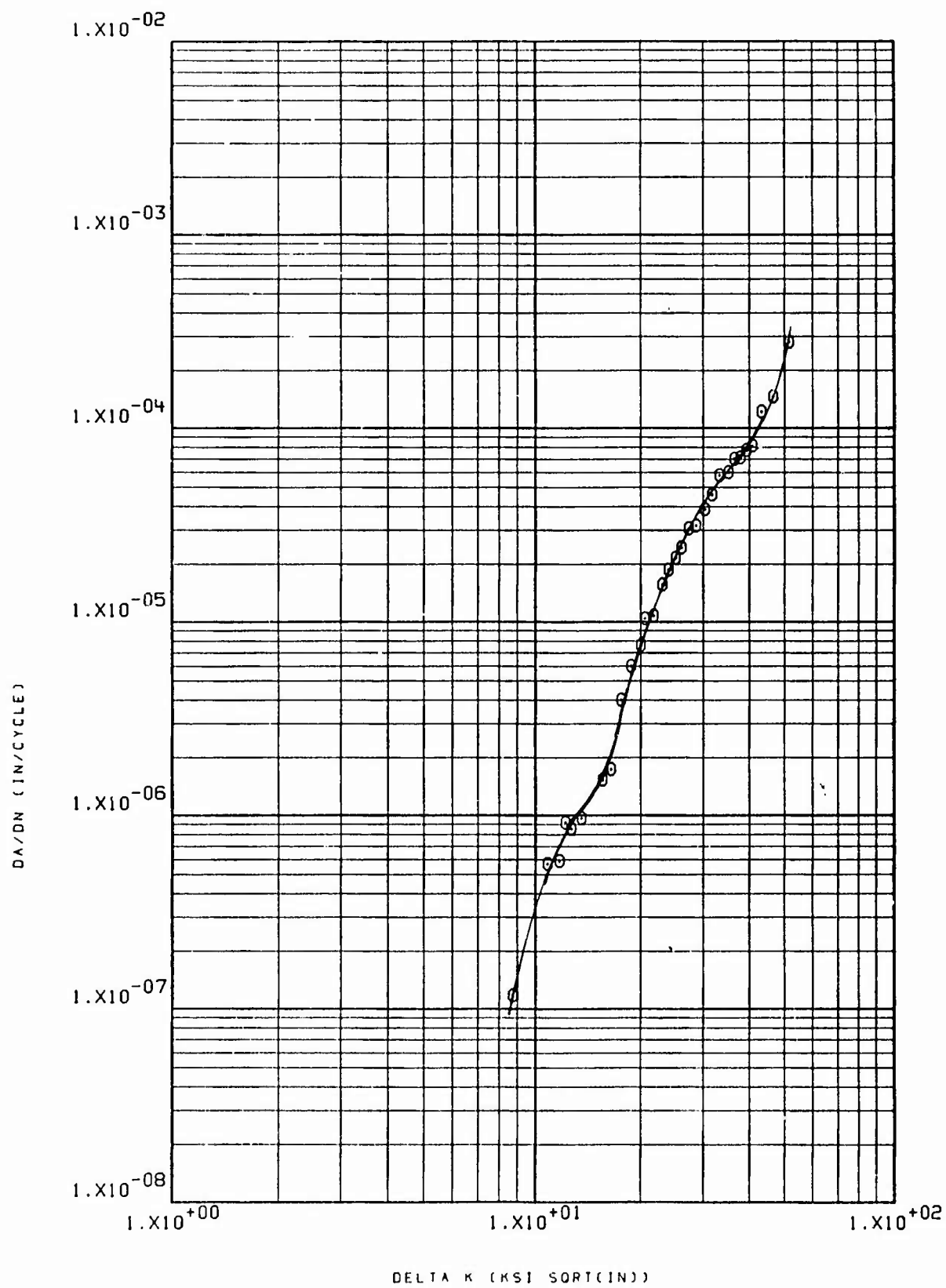


6.7 IN/R 23.5

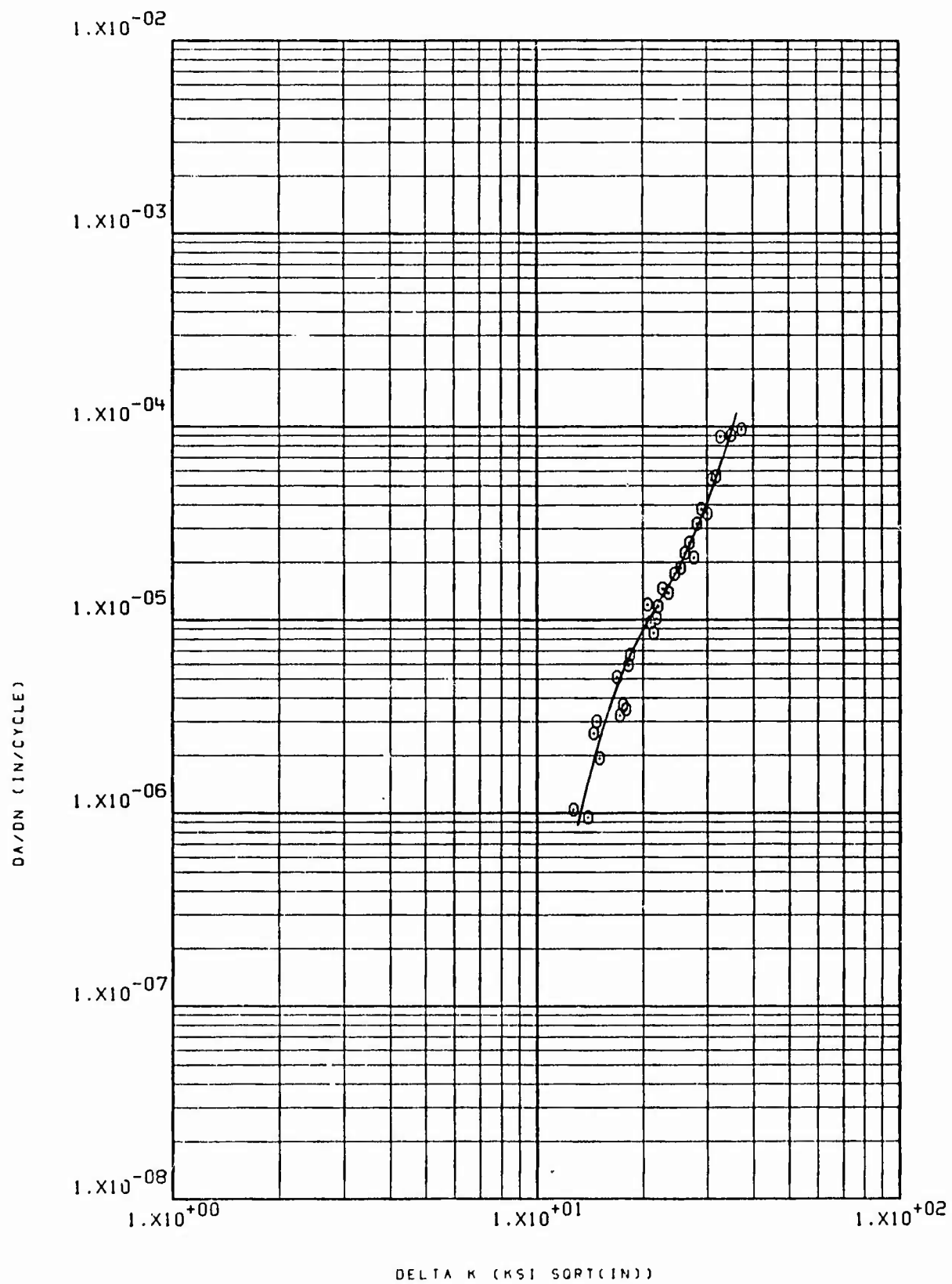
II GAL 4V RA

HA

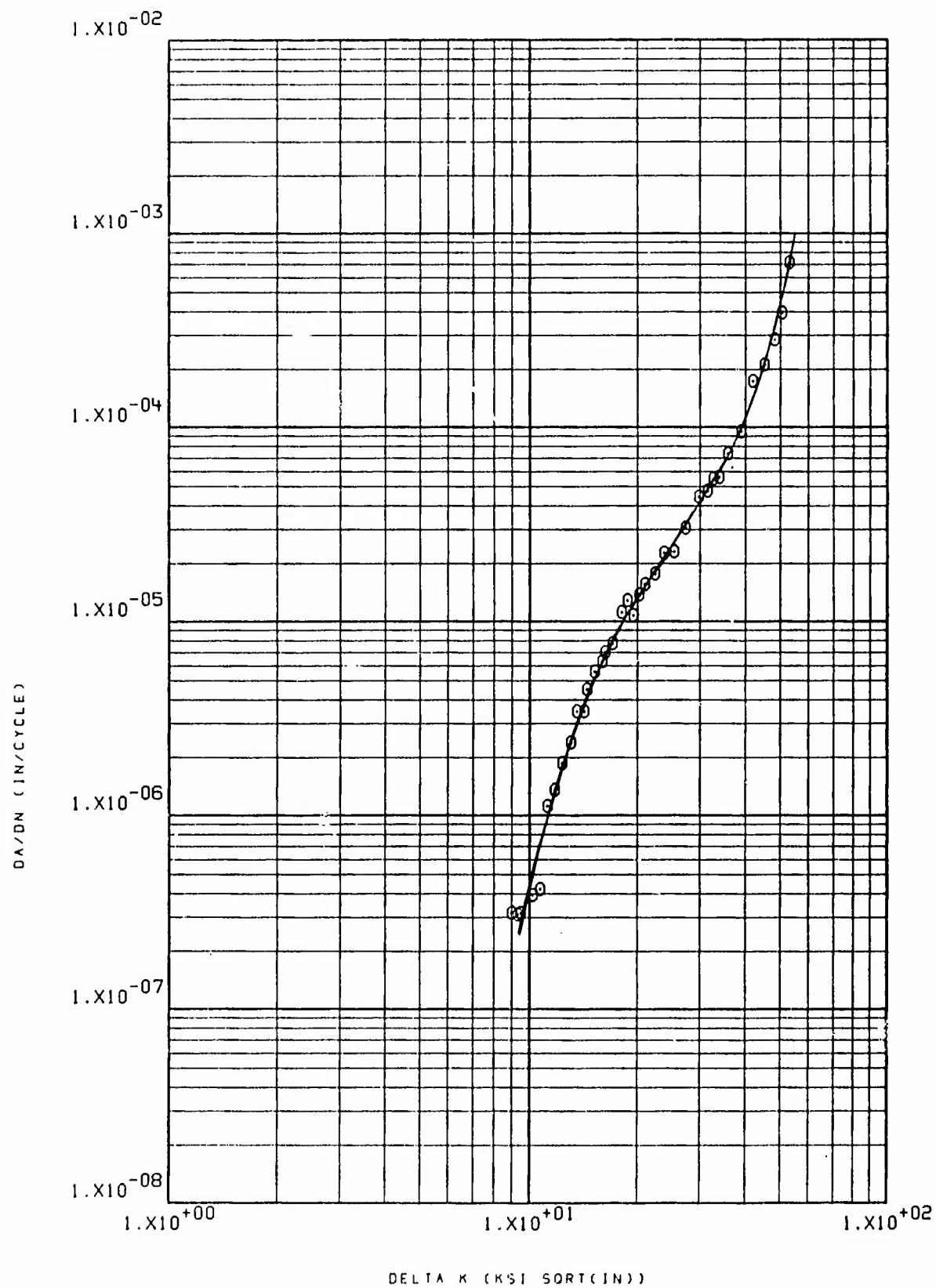
RT 360CPH P. 08



67 NPW 29-8 T1-6AL-4/ RA SUMP RT 60CPH R=.08



67 NP# 29-15 T1-6AL-4V PA 5TW RT R=.08 6CPH

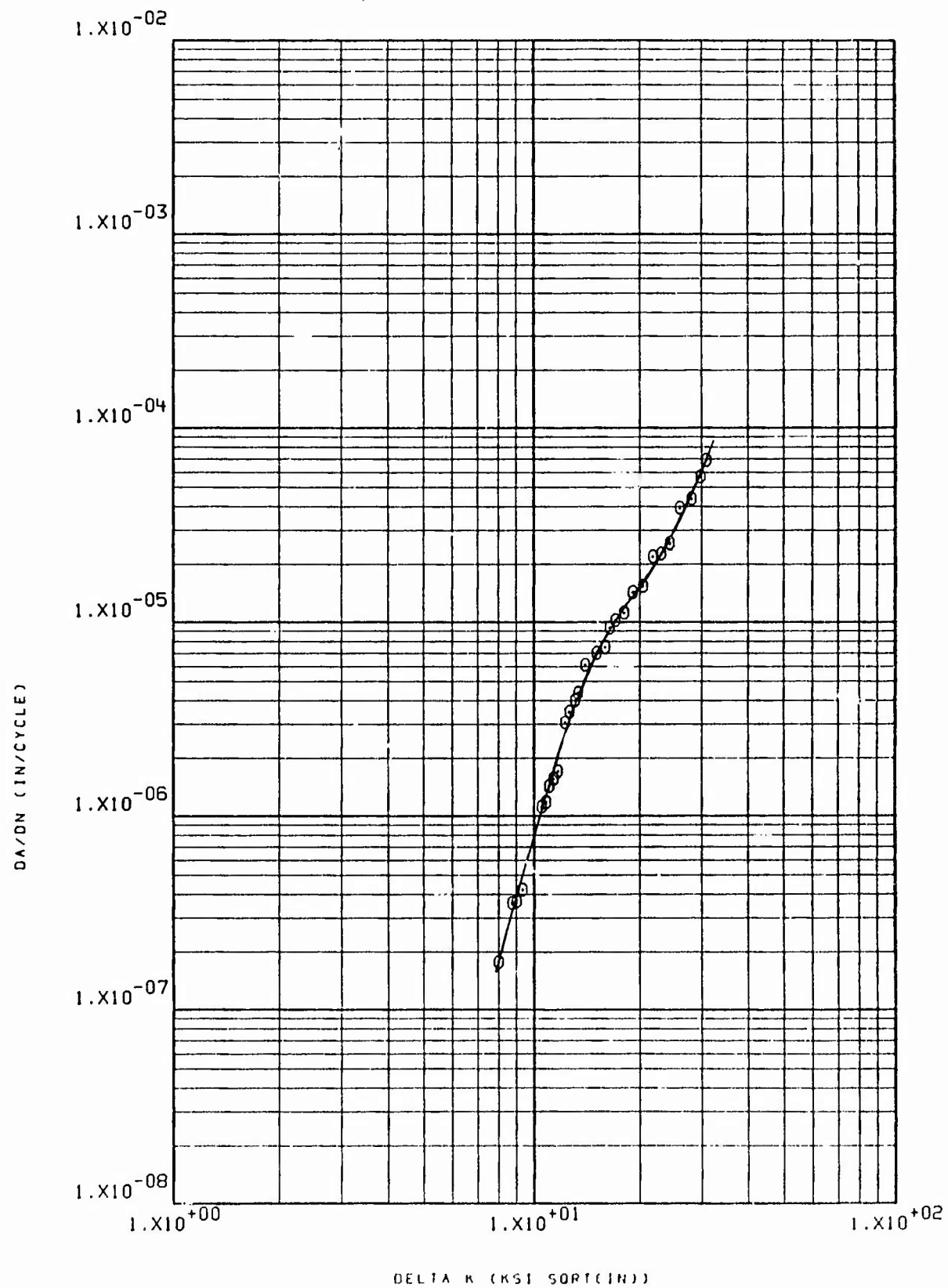


67 NPW 29-16

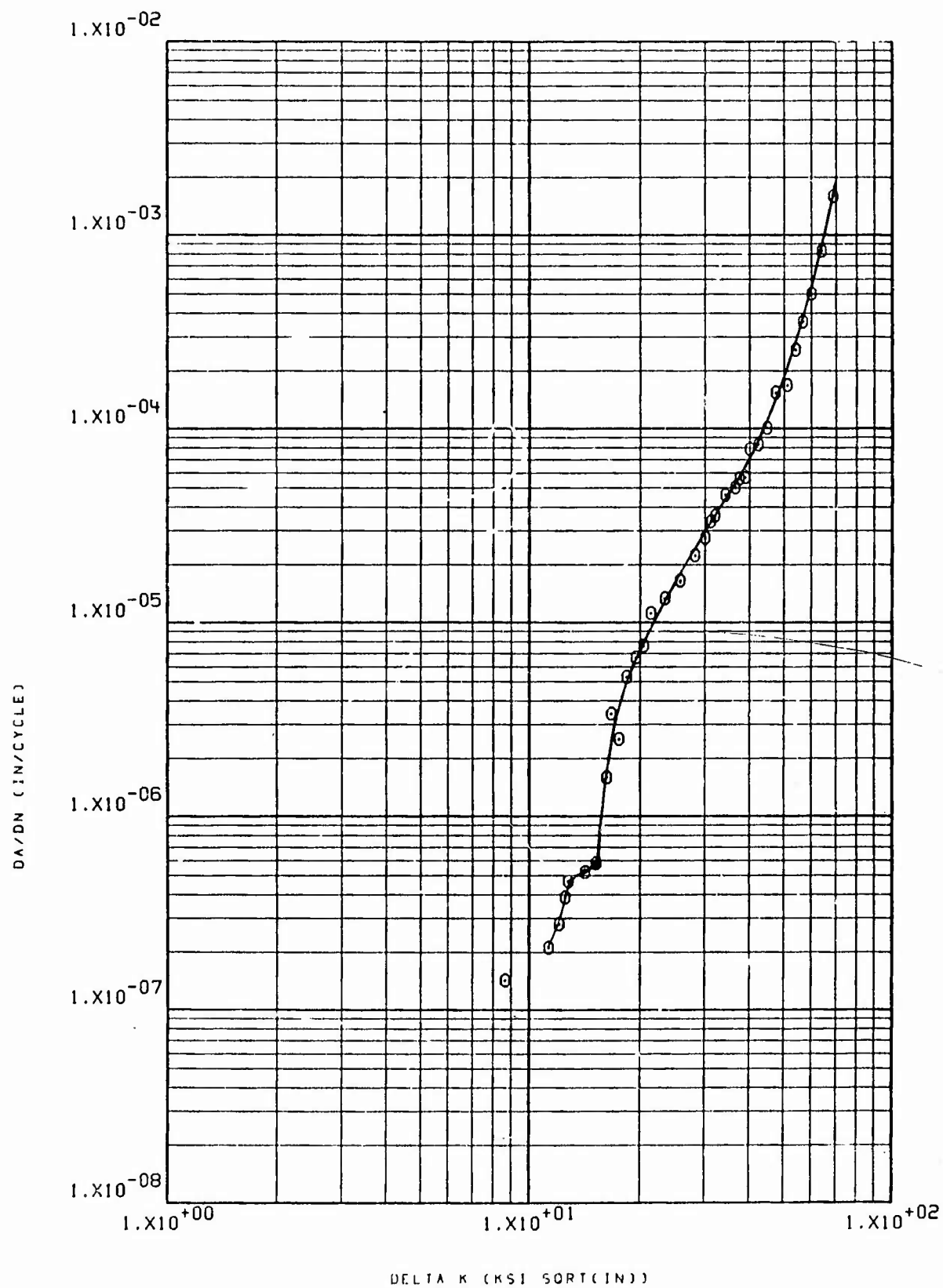
T1-6A1-4V PA

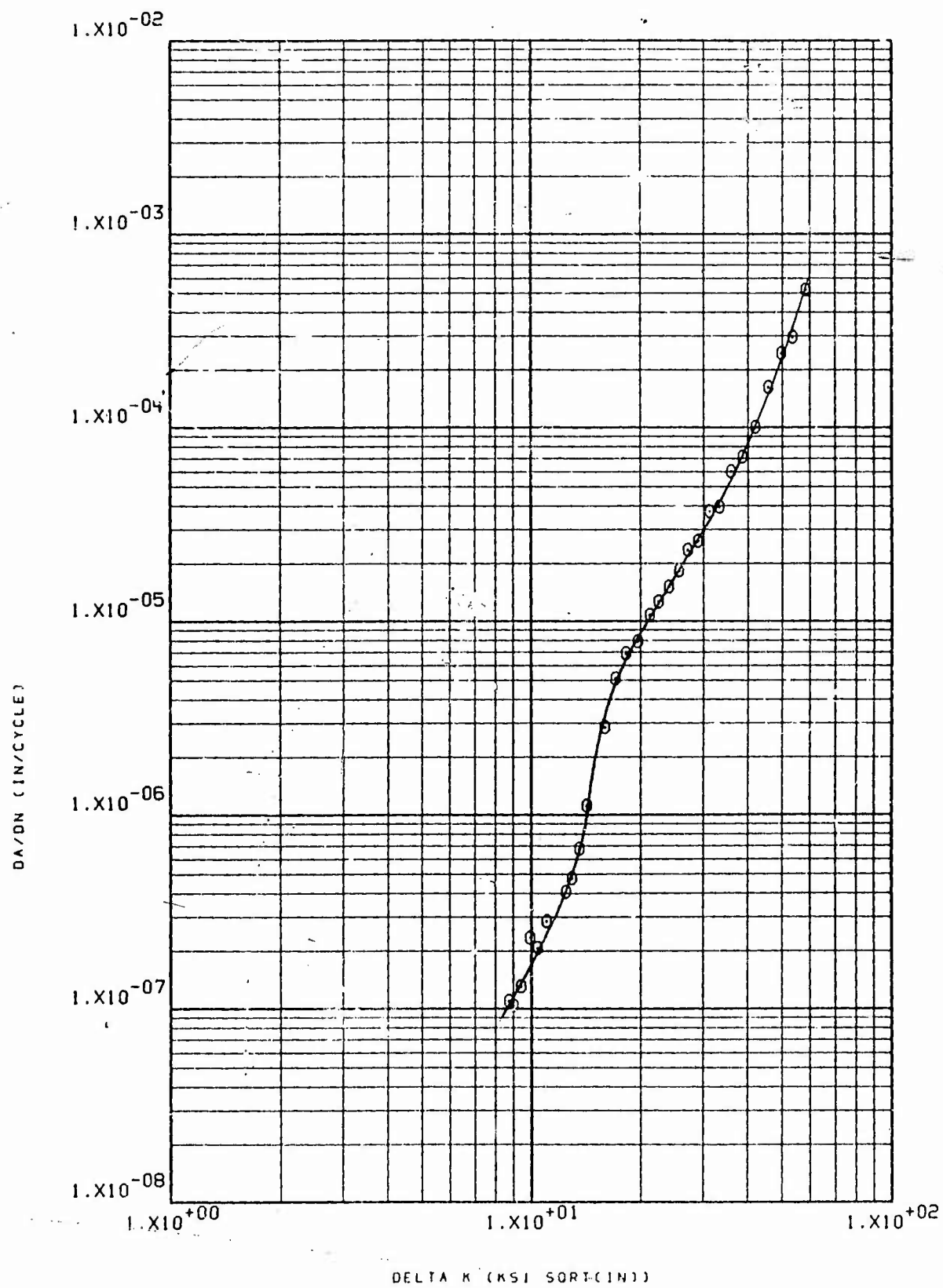
LHA

RT 360CPM R=0.3



67 HP# 29-17 11-6AL-4V RA LHA RT 360CPM R-1.5

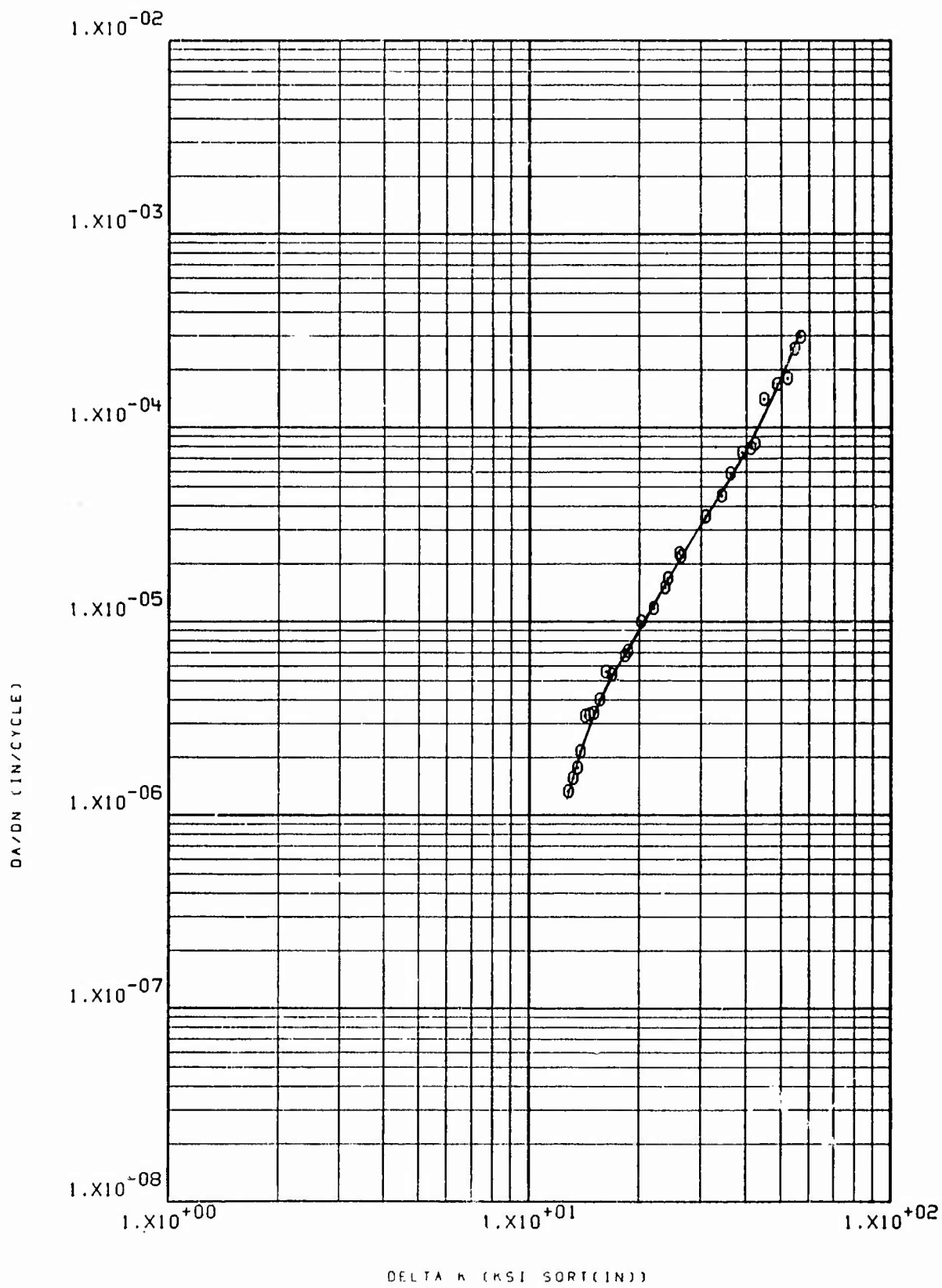




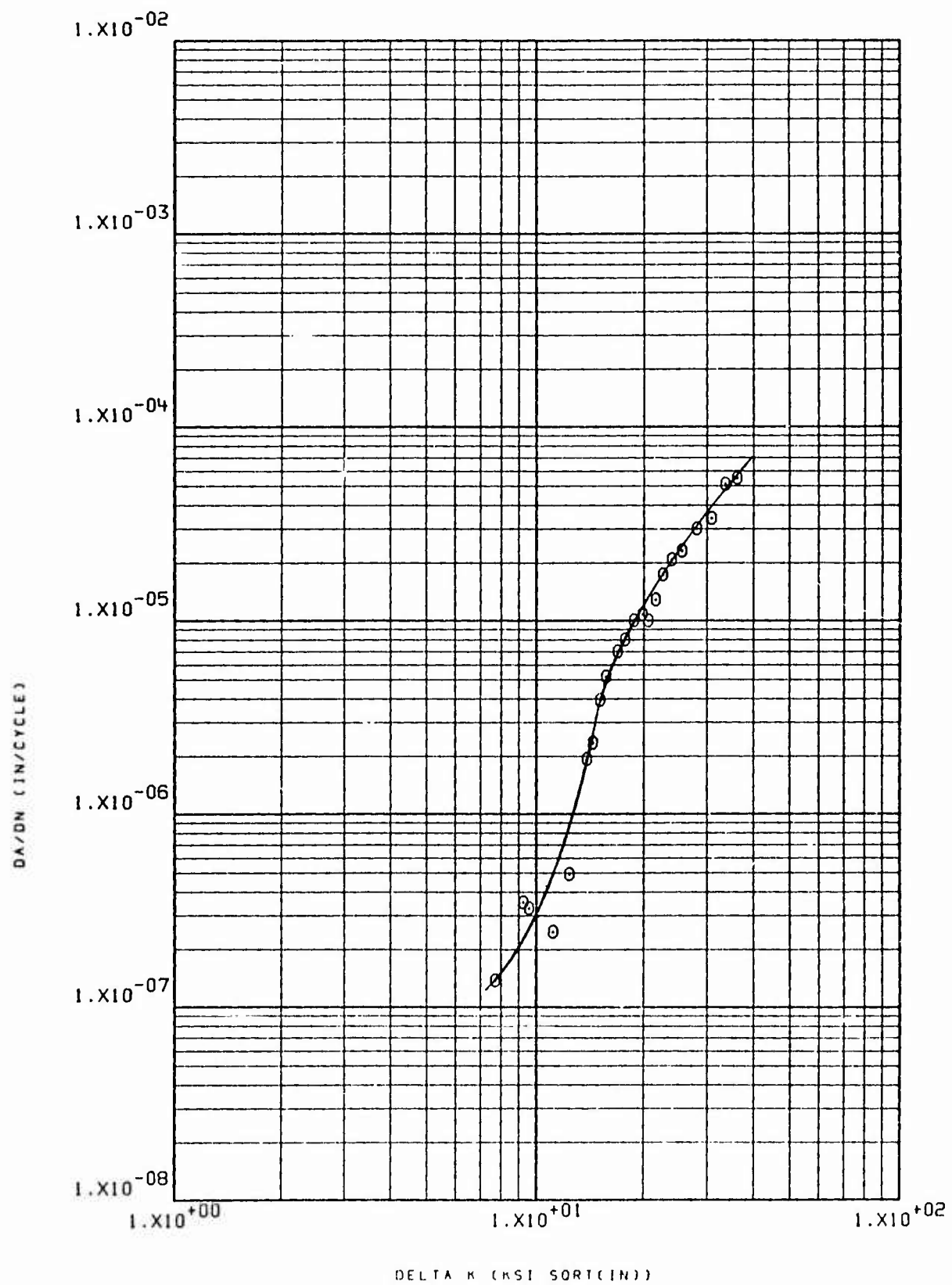
67 HPW 29-20

11-6AL 4V RA LHA

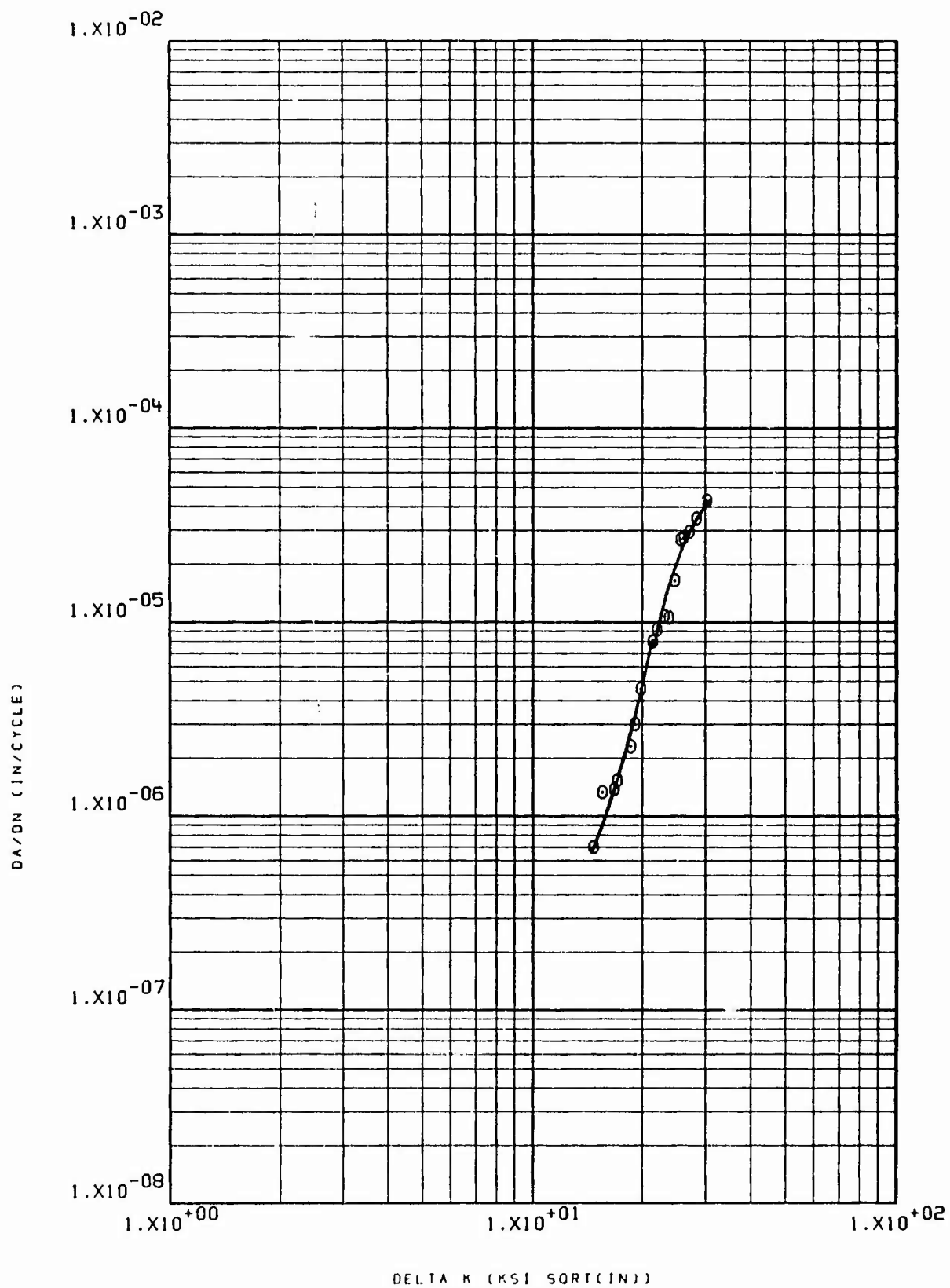
RT 360CPM R=.08



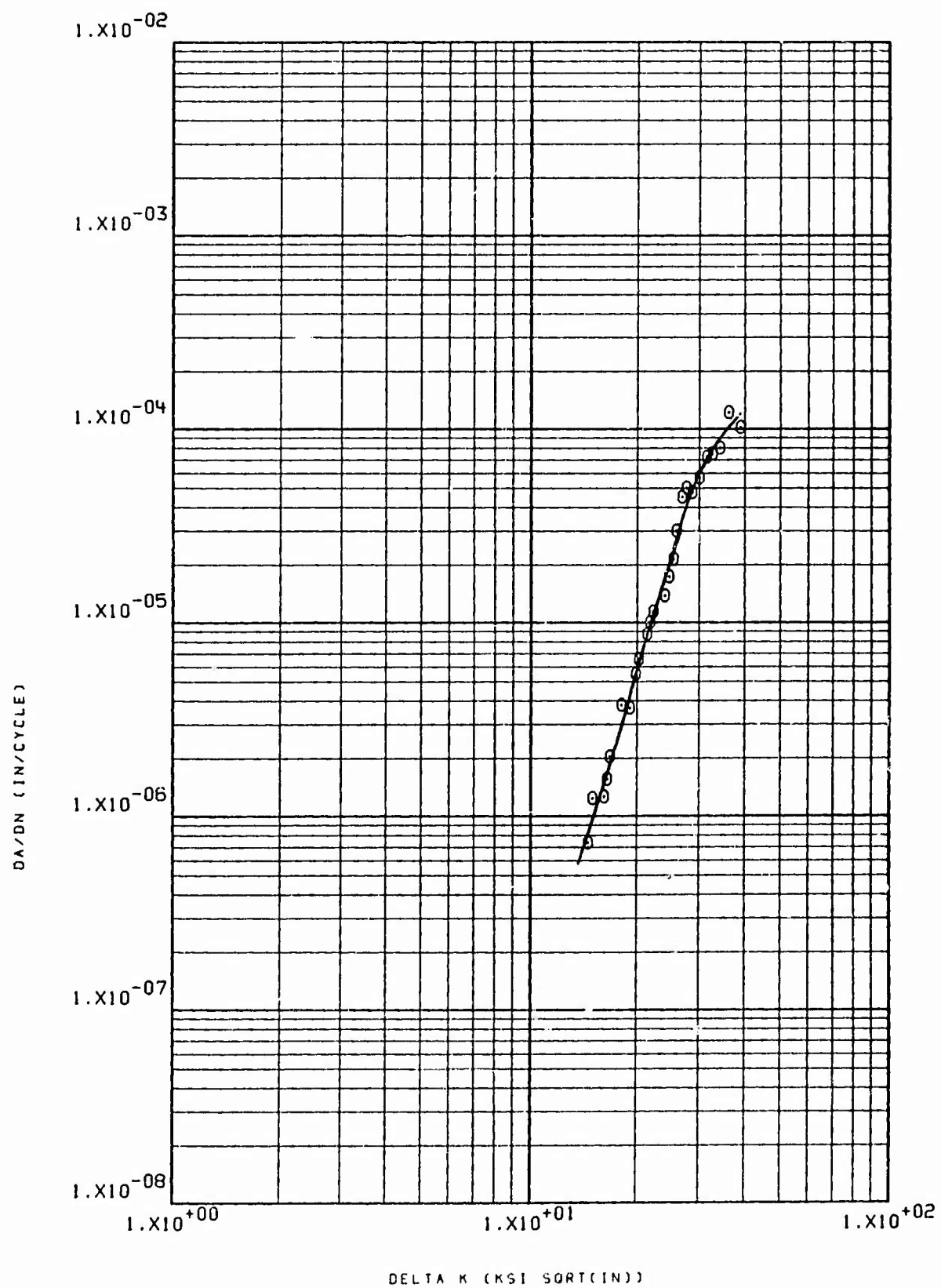
67 NPW 29-21 GAL-4V T1 PA LHA PT .08 360CPM



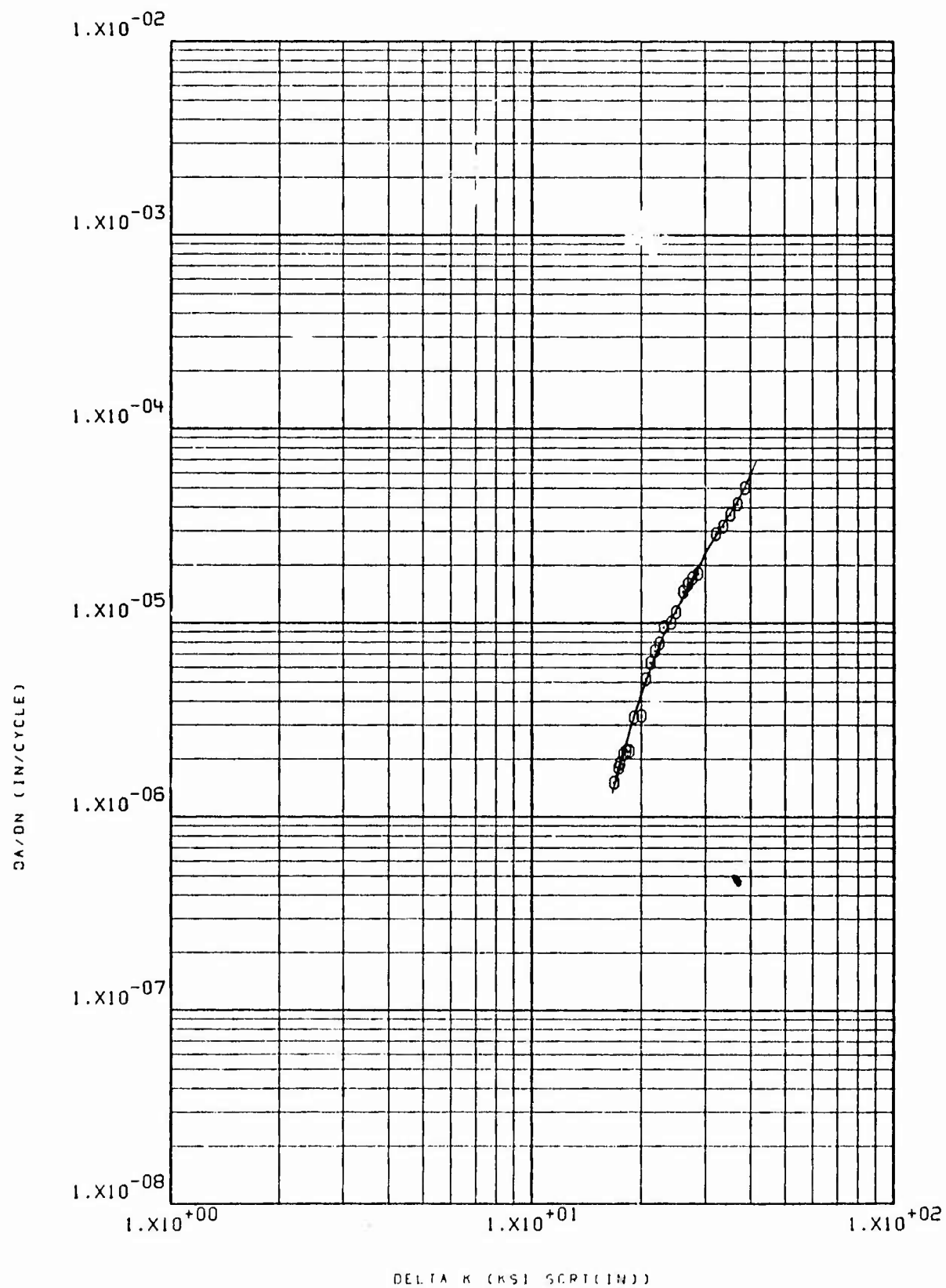
67 NR# 29-38 T1-6AL-4V PA LHA +265 P .08 360CPM



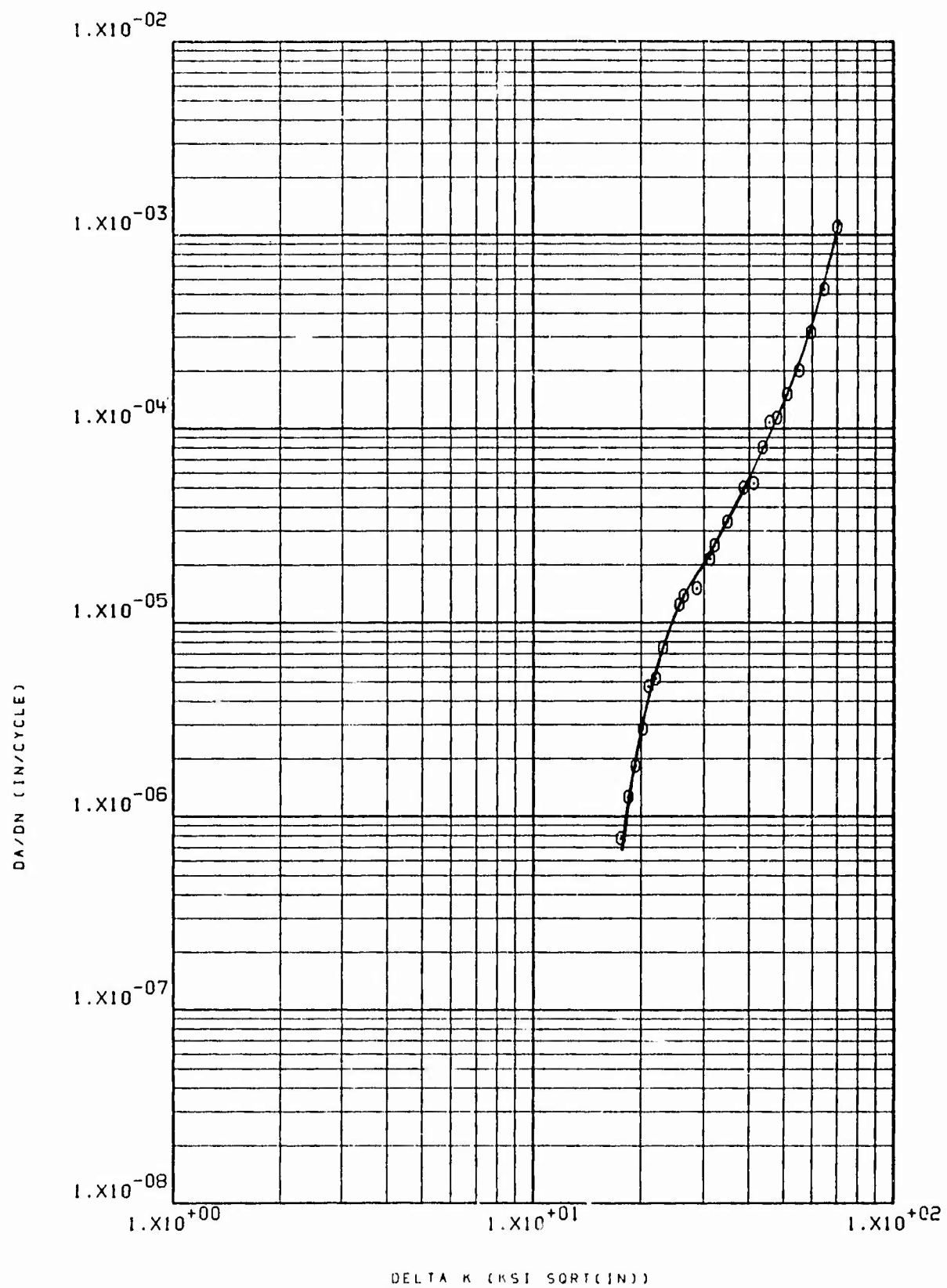
60 HWP 32-10 T1 GAL 4V RA SUMP RT R-.08 60CPM



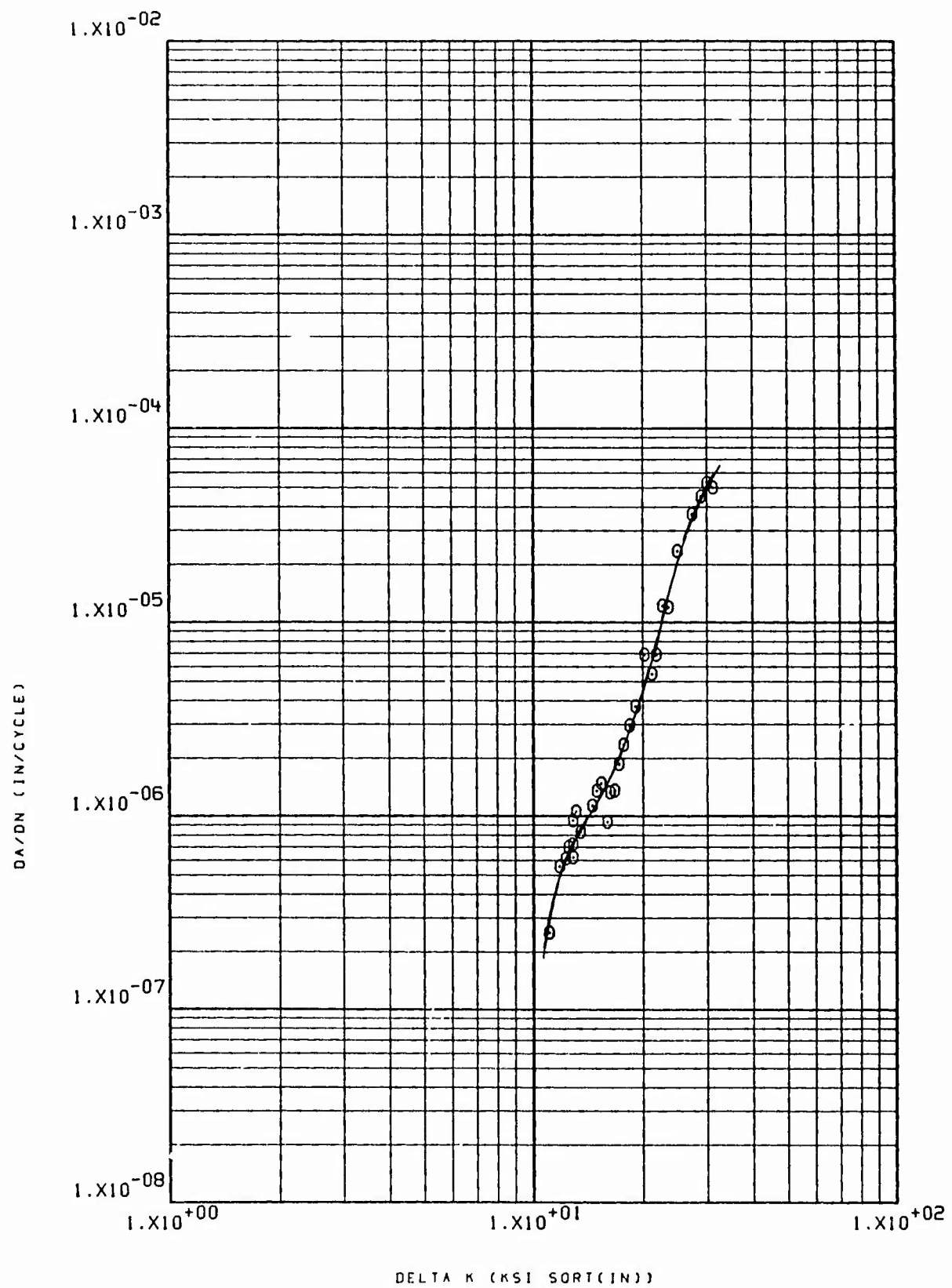
68 NPW 32-11 TI-6AL-4V RA 2IN PLATE SUMP 150F R=.08 60CPM



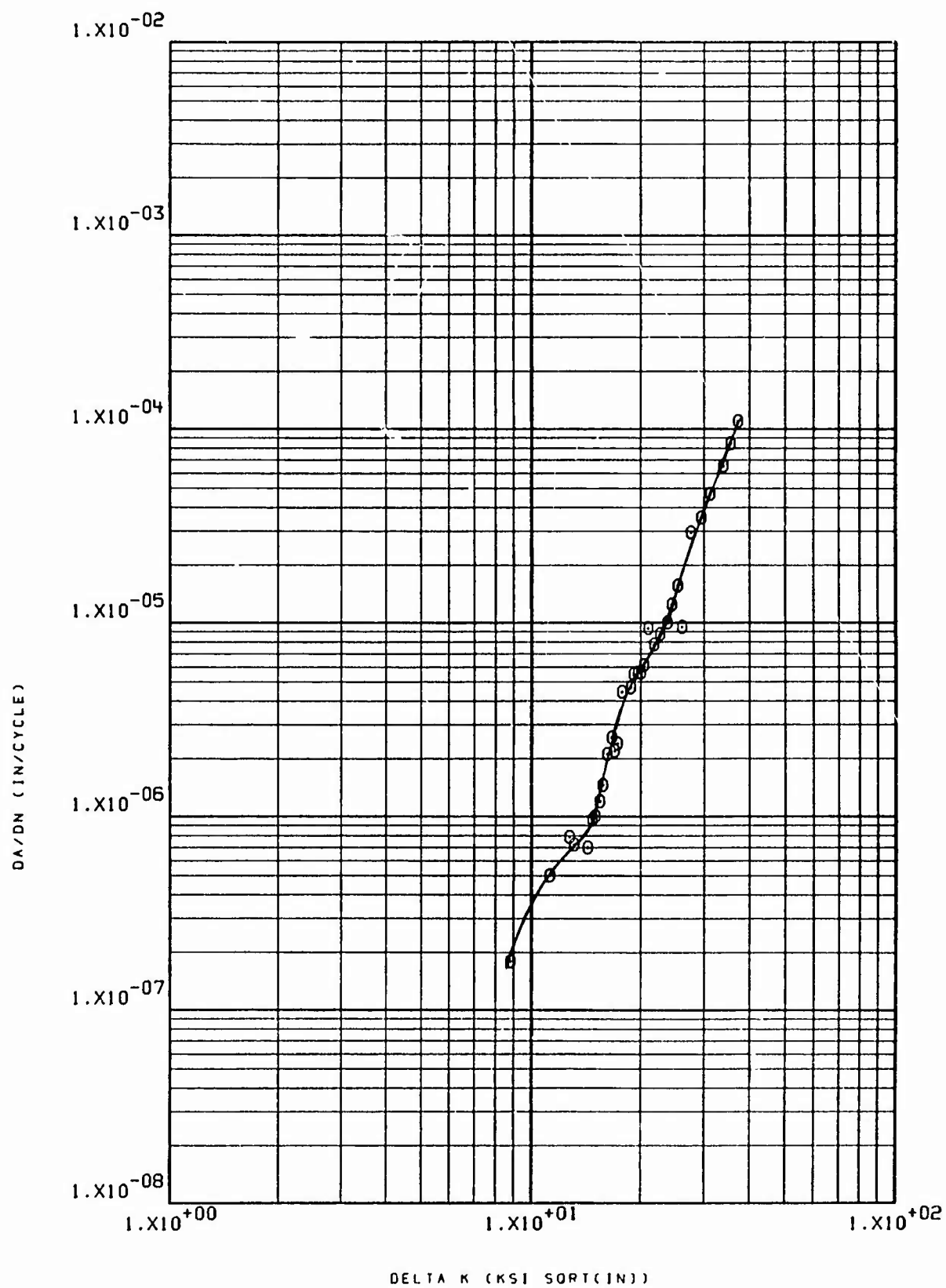
CB NP# 32 12 TI GAL 4V RA LHA PT P. 08 360CPH



63 4PW 33-7 TI GAL-4V PA LHA RT .08 360CPH

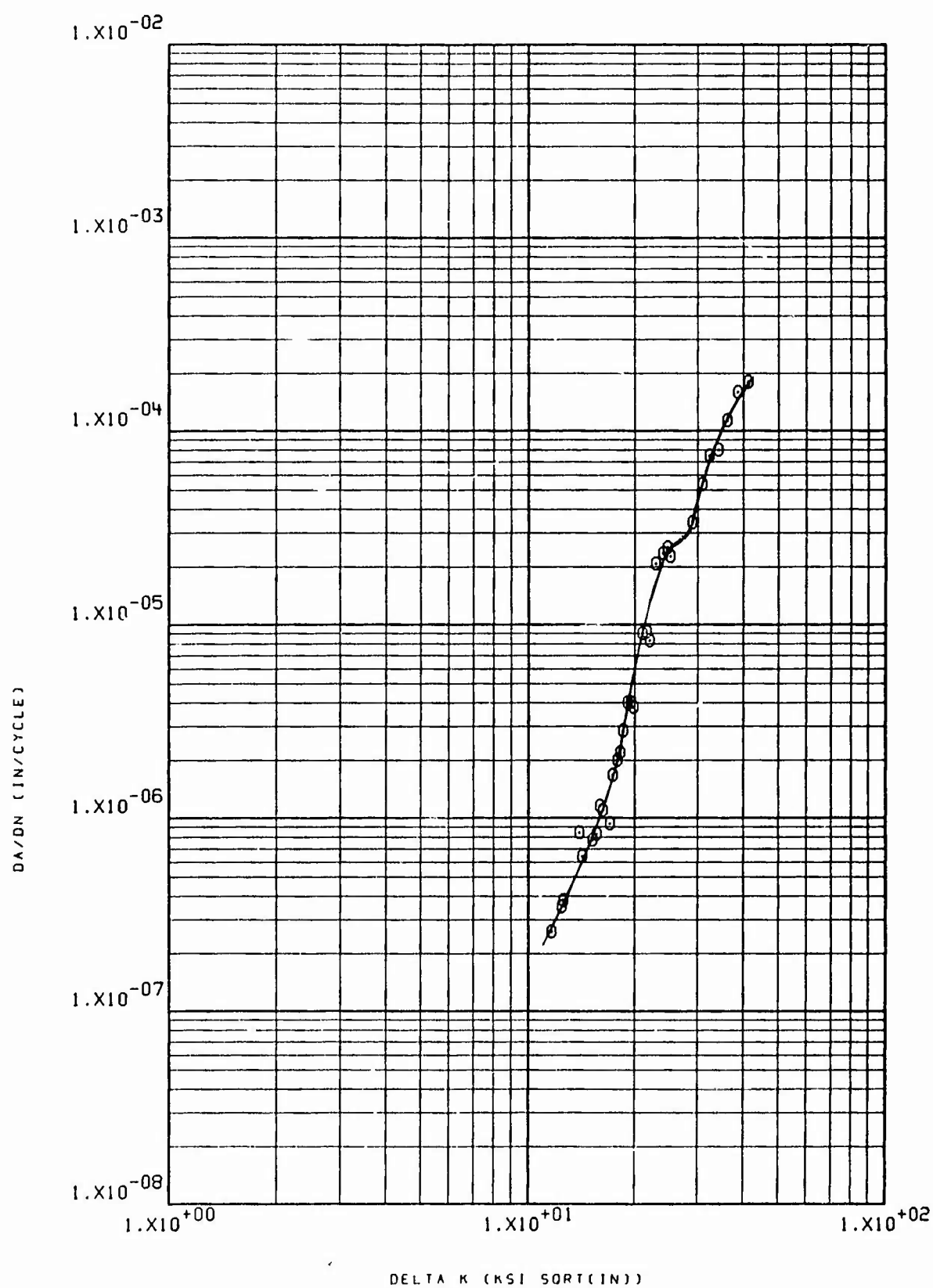


70 HPW 39-13 T1 6AL-4V RA SUMP RT R=.08 60CPM



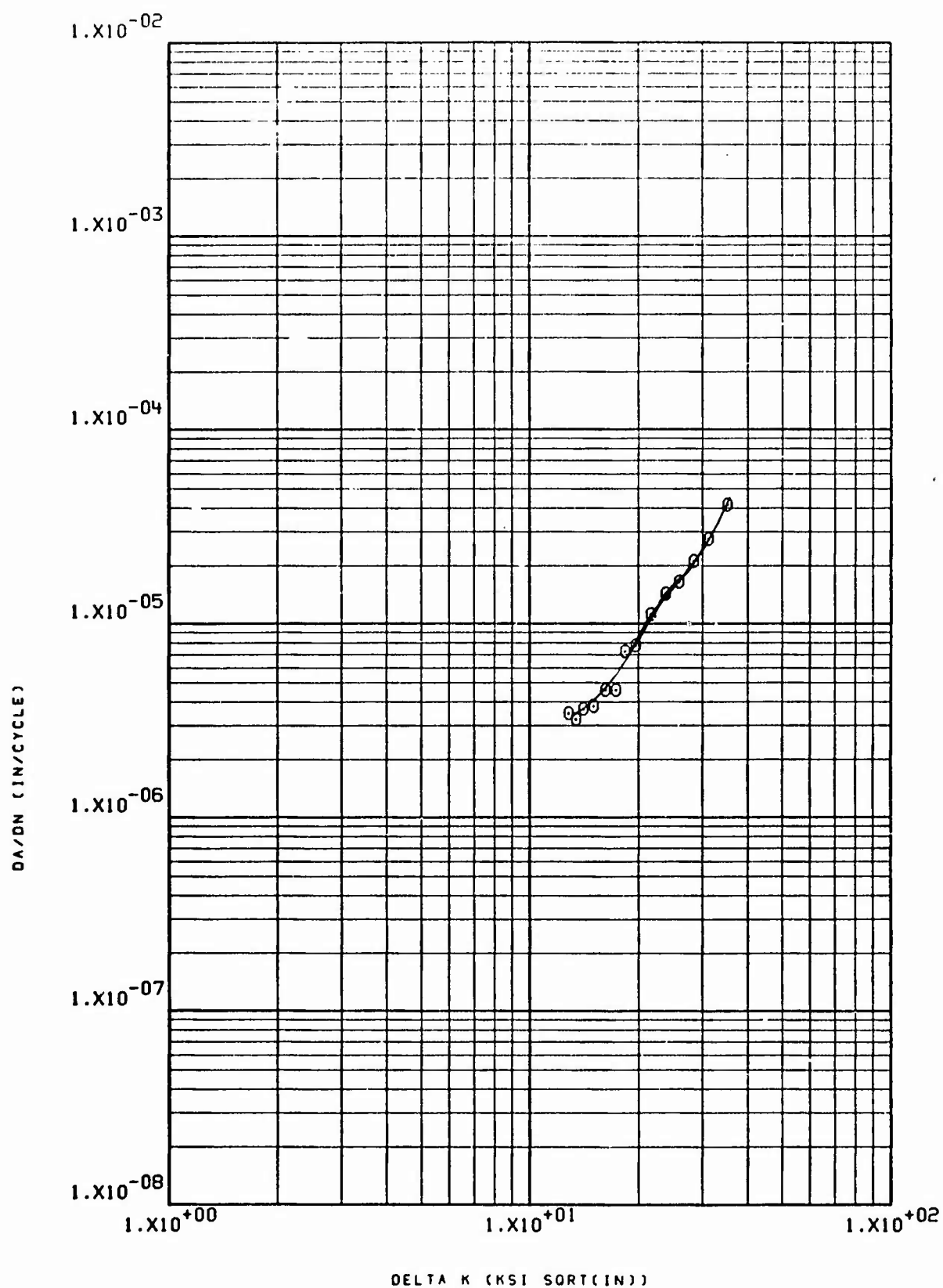
70 HPW 39-14 TI 6AL-4V DBTC

SUMP RT R=.08 60CPM

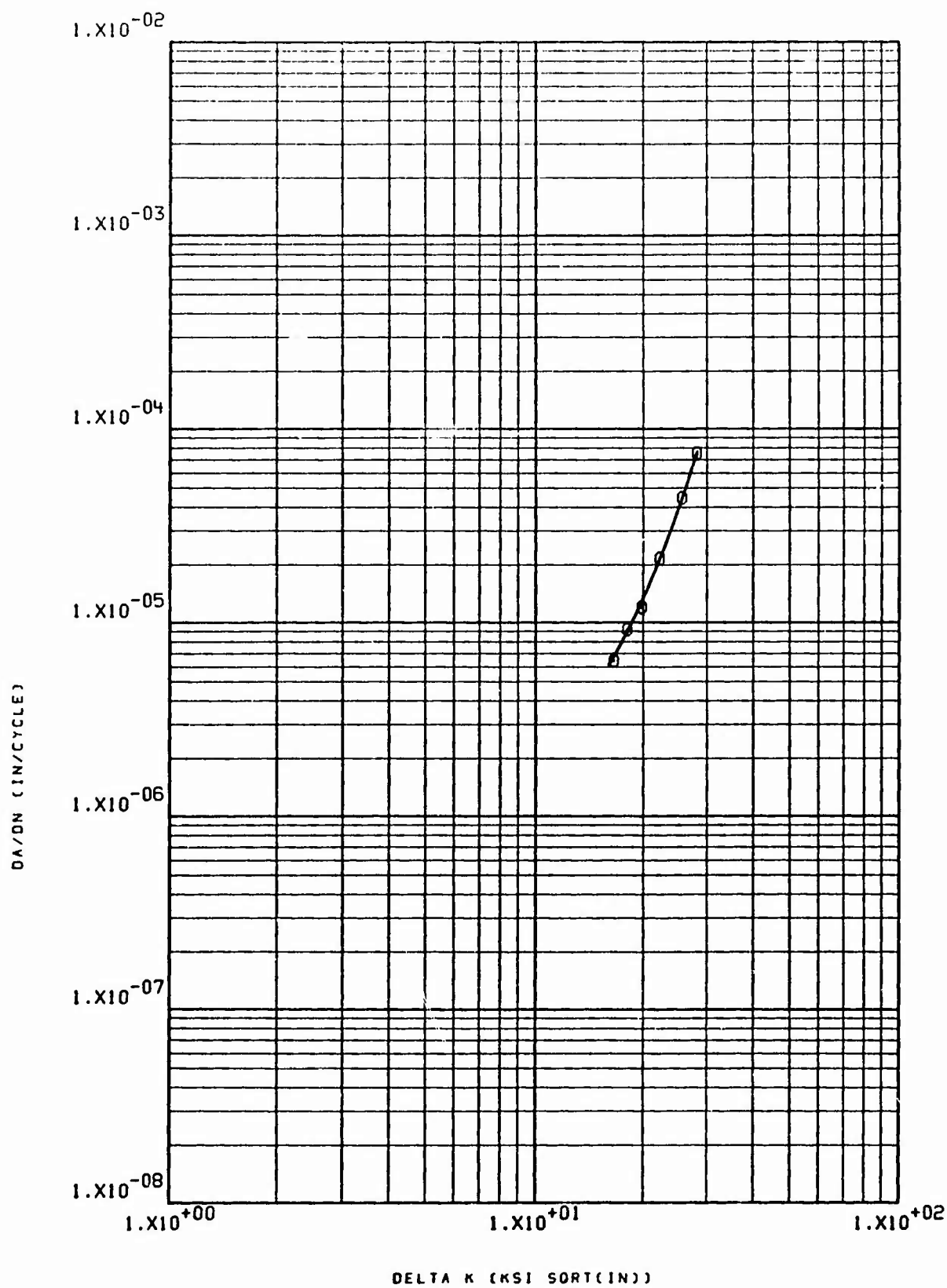


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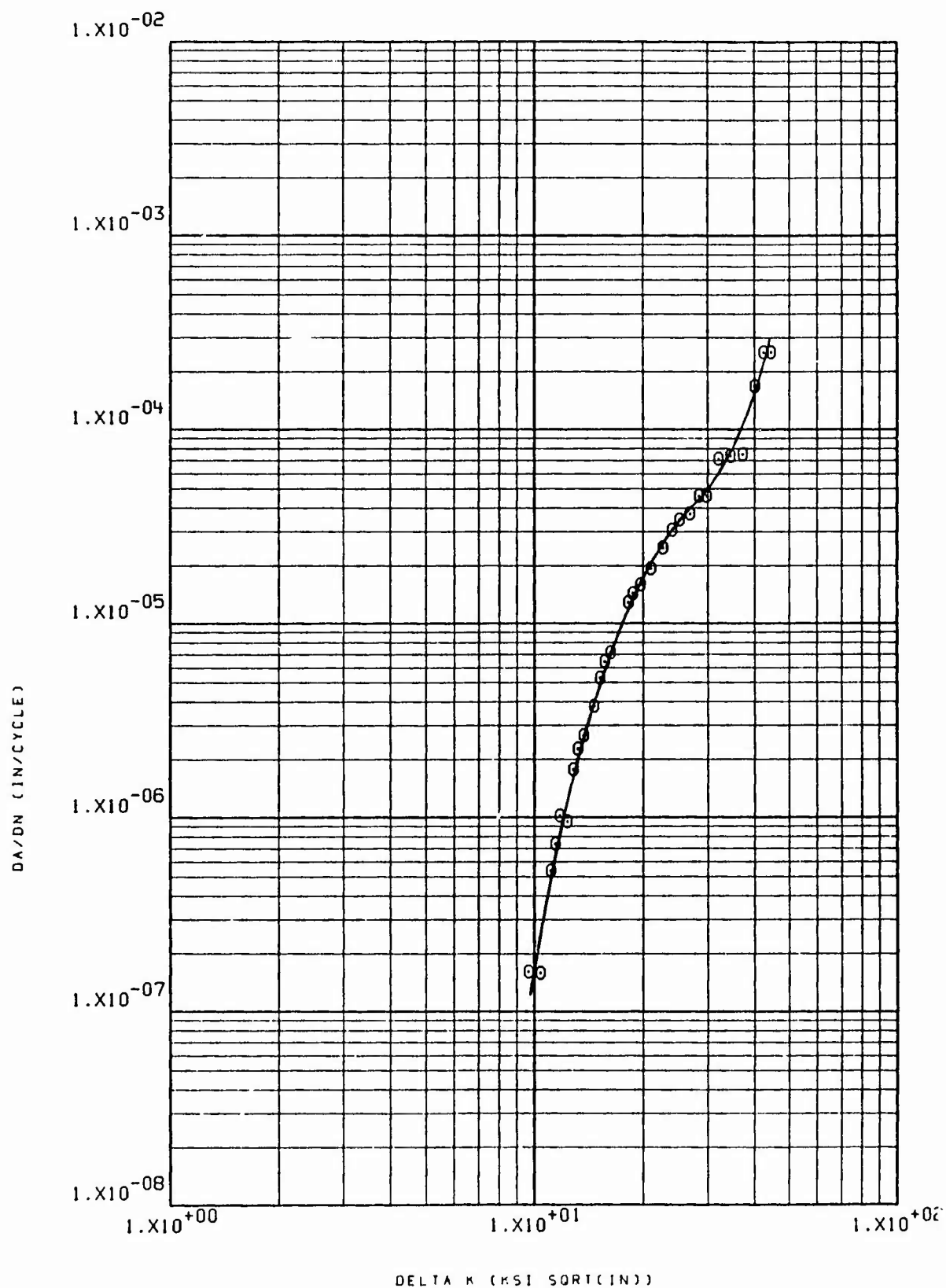
SUMP RT R=.08 60CPM

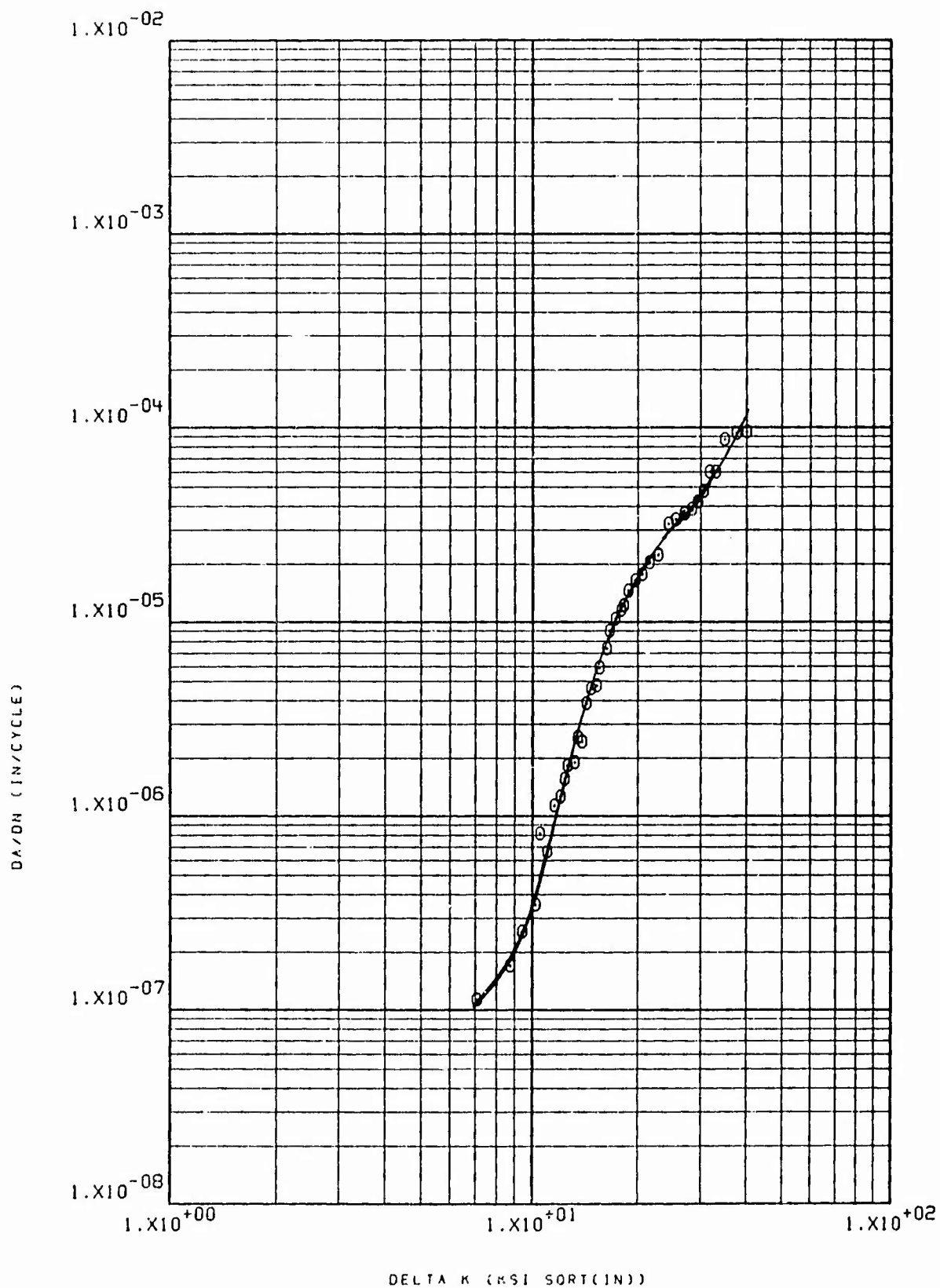


72 NRW 46-1 T1-6AL-4V RA FCS RT R=.08 60CPH

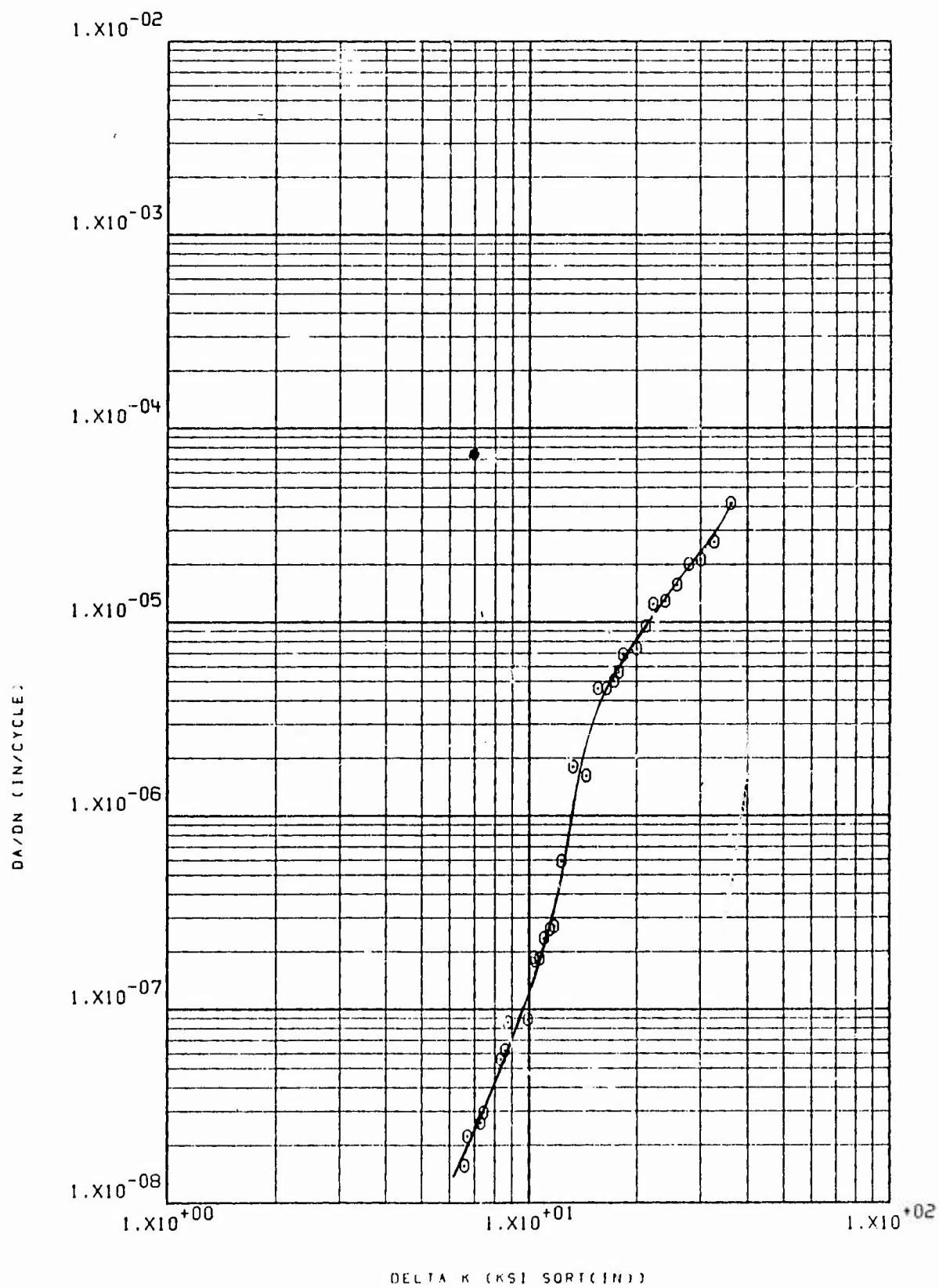


72 NWR 46-2 TI-6AL-4V RA STW RT R=.08 6CPH



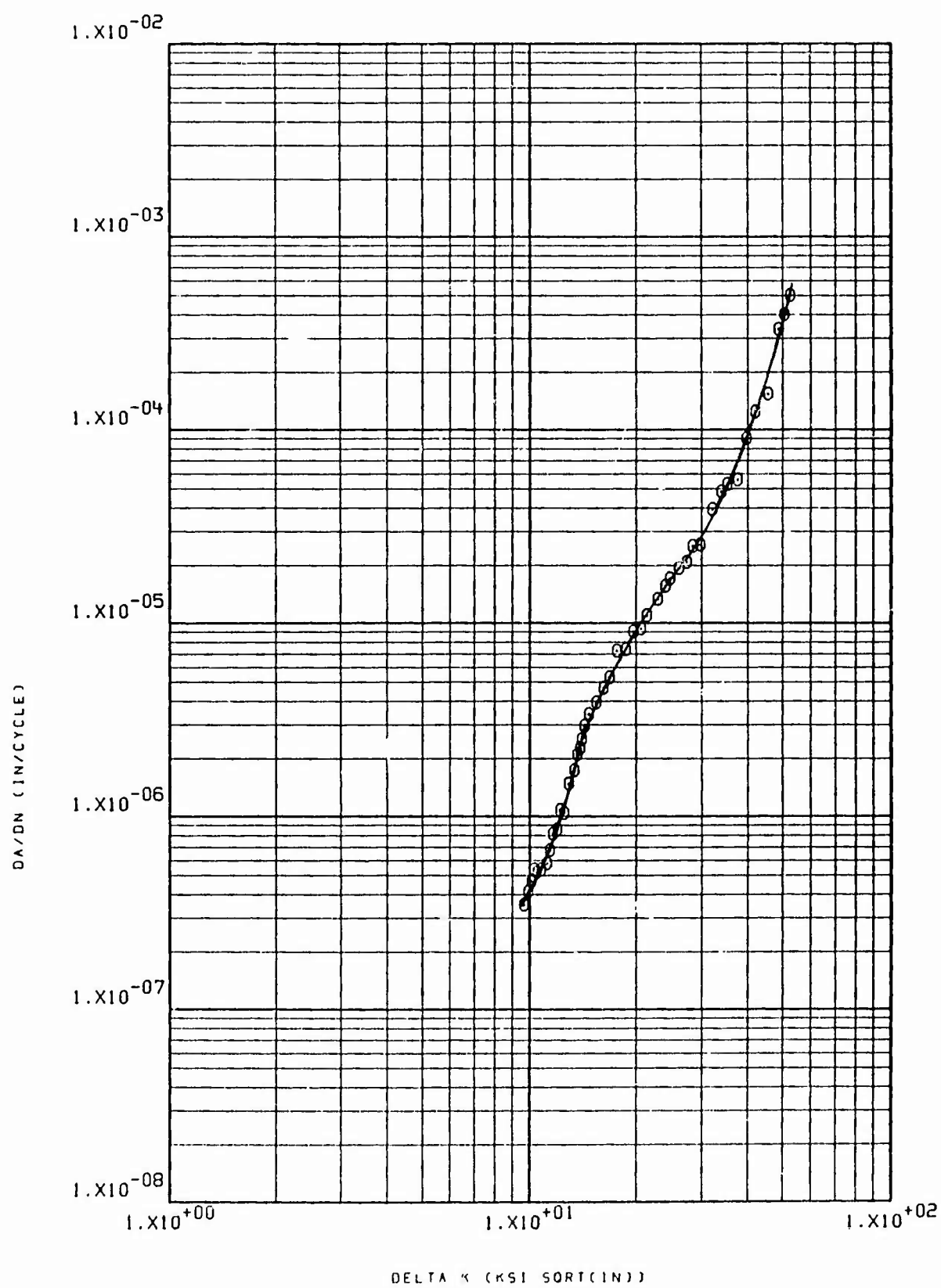


72 HPW 46-25 11 GAL 4V DBTC SUMP RT 60CPM R=.08



72 NPW 46-26

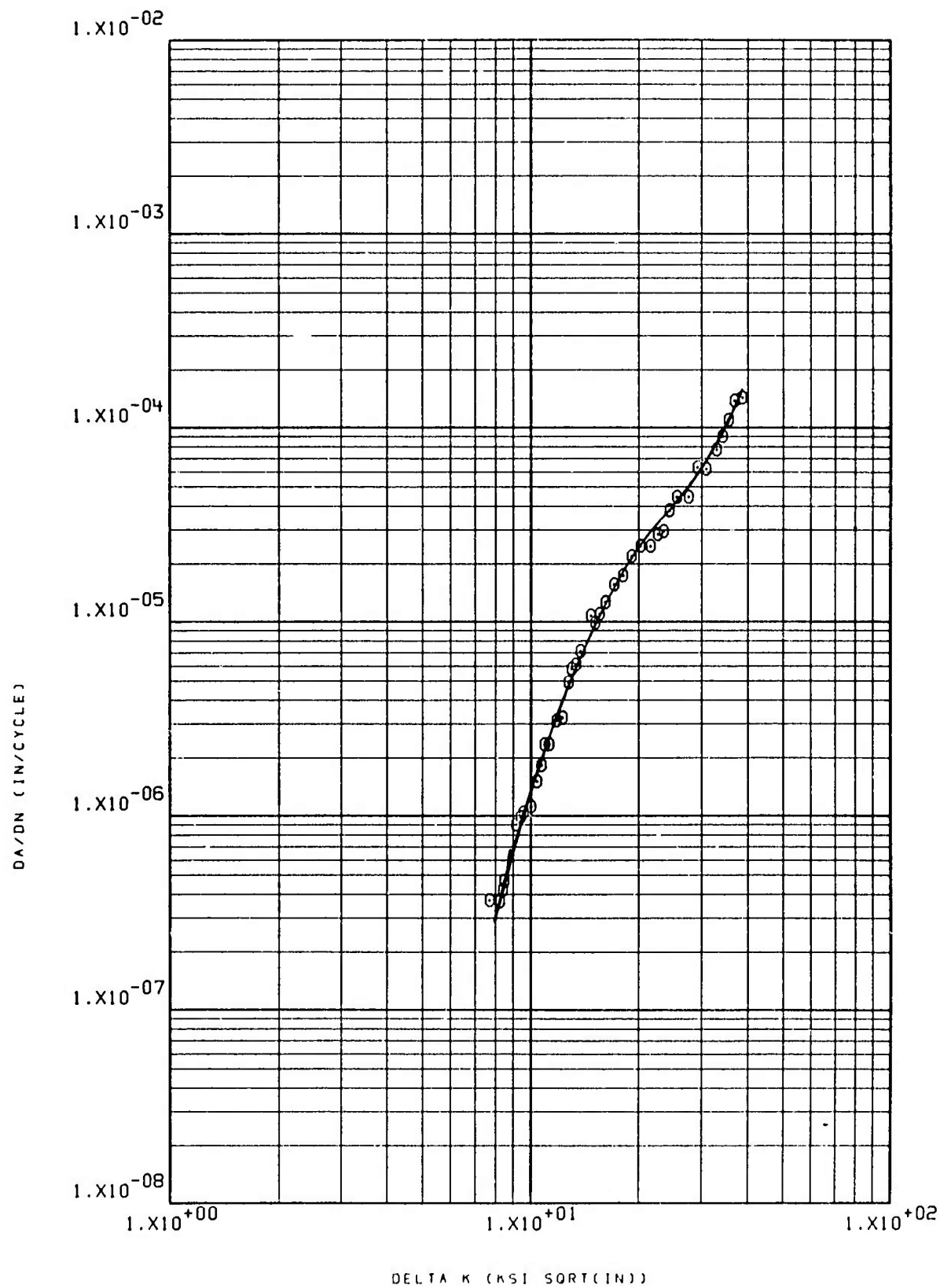
11 GAL 4V RA LHA RT 3600CPH P-1.08



72 HRW 46-27

11-6AL-4V PA LHA

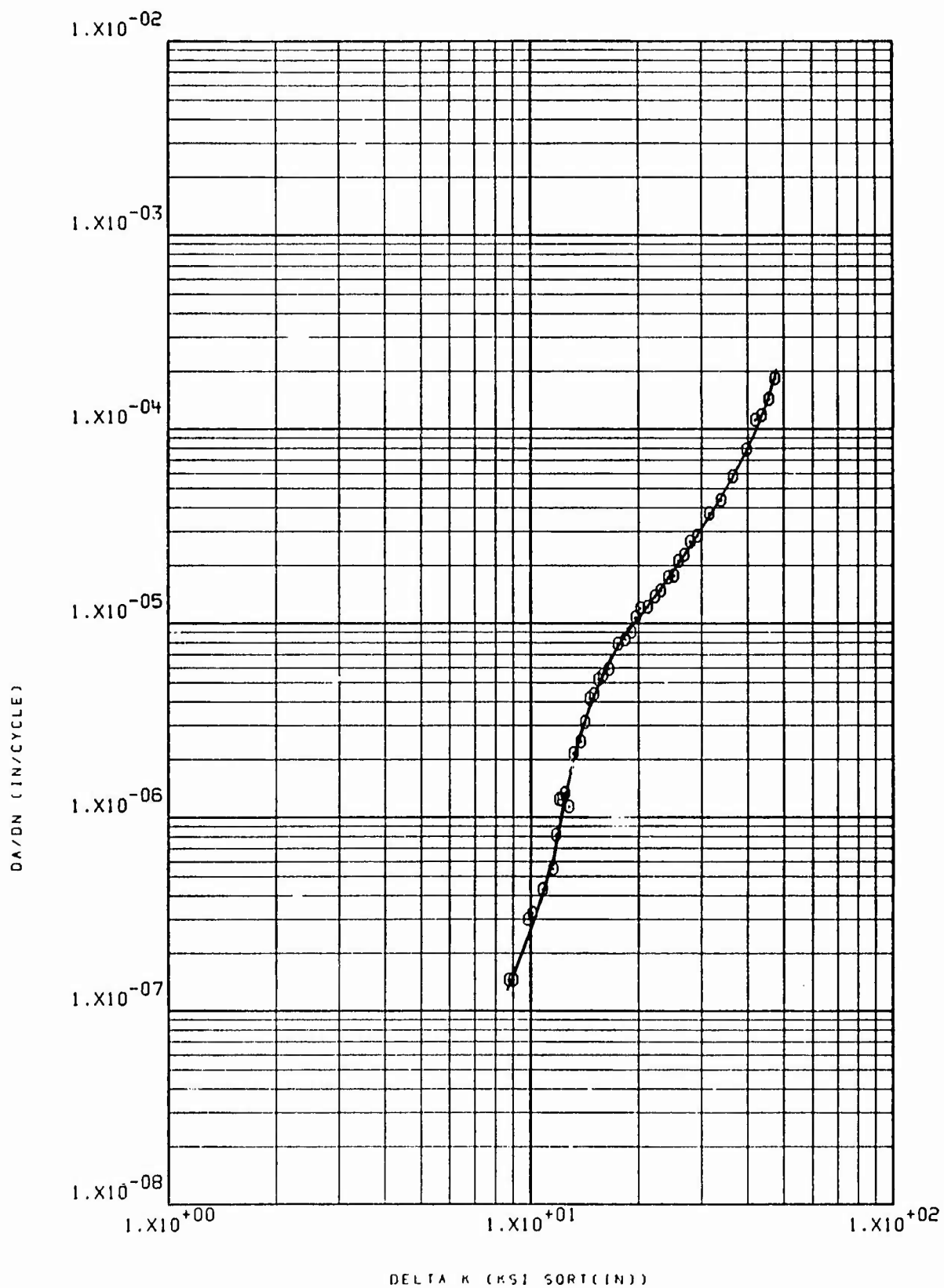
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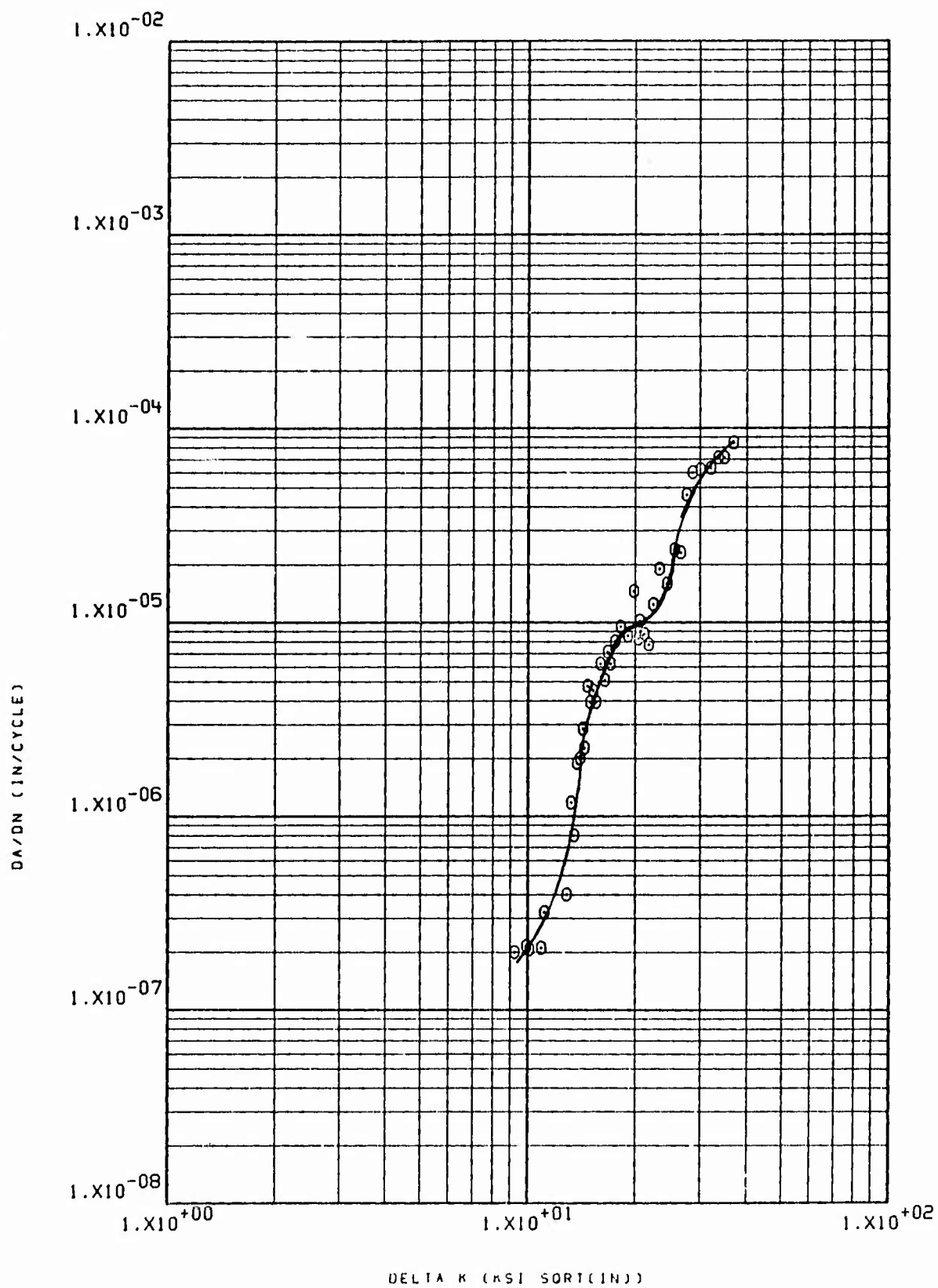
72 HPM 46-28

11-GAL-4V PASUMP

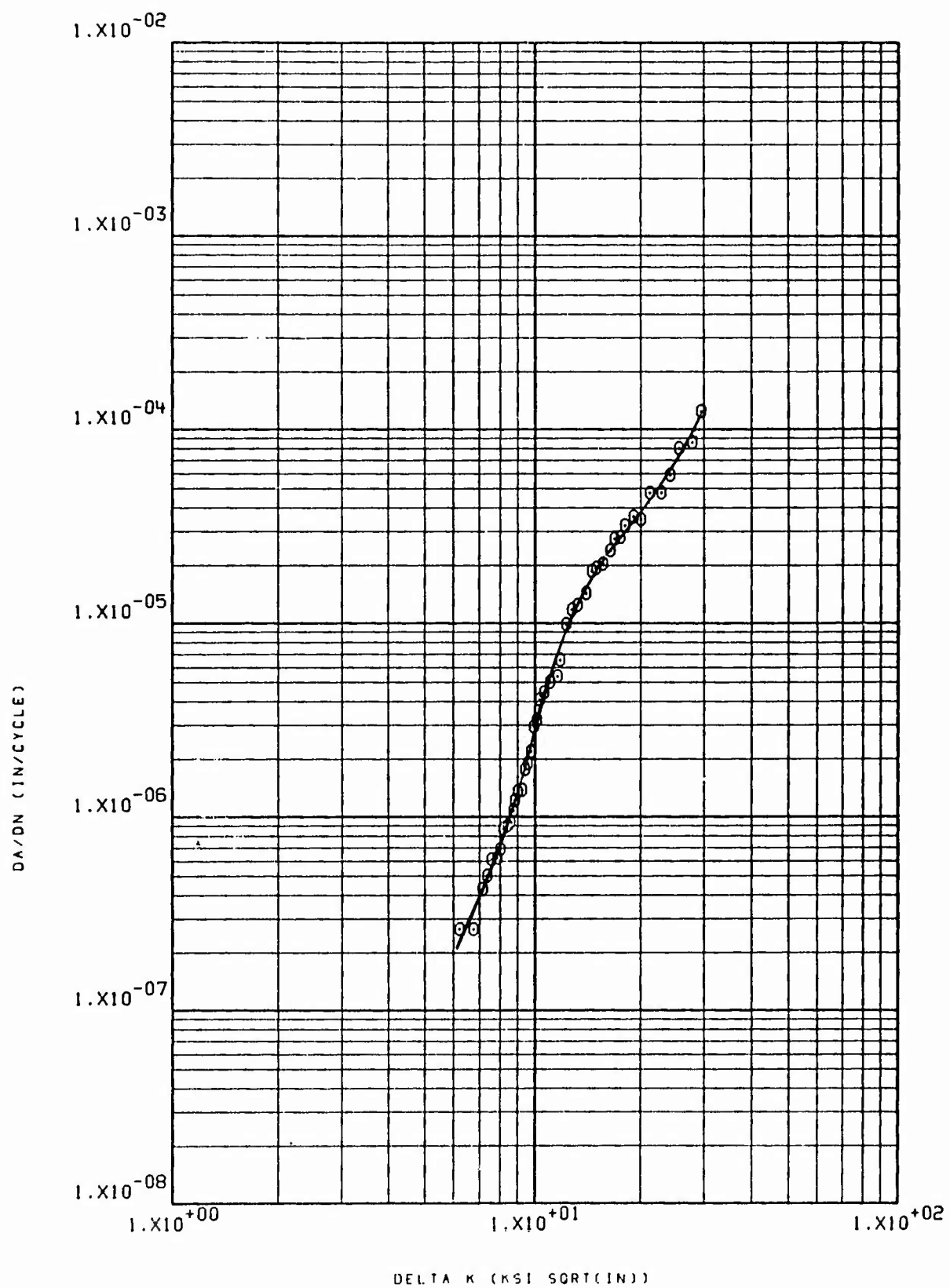
RT 60CPH R-1.3



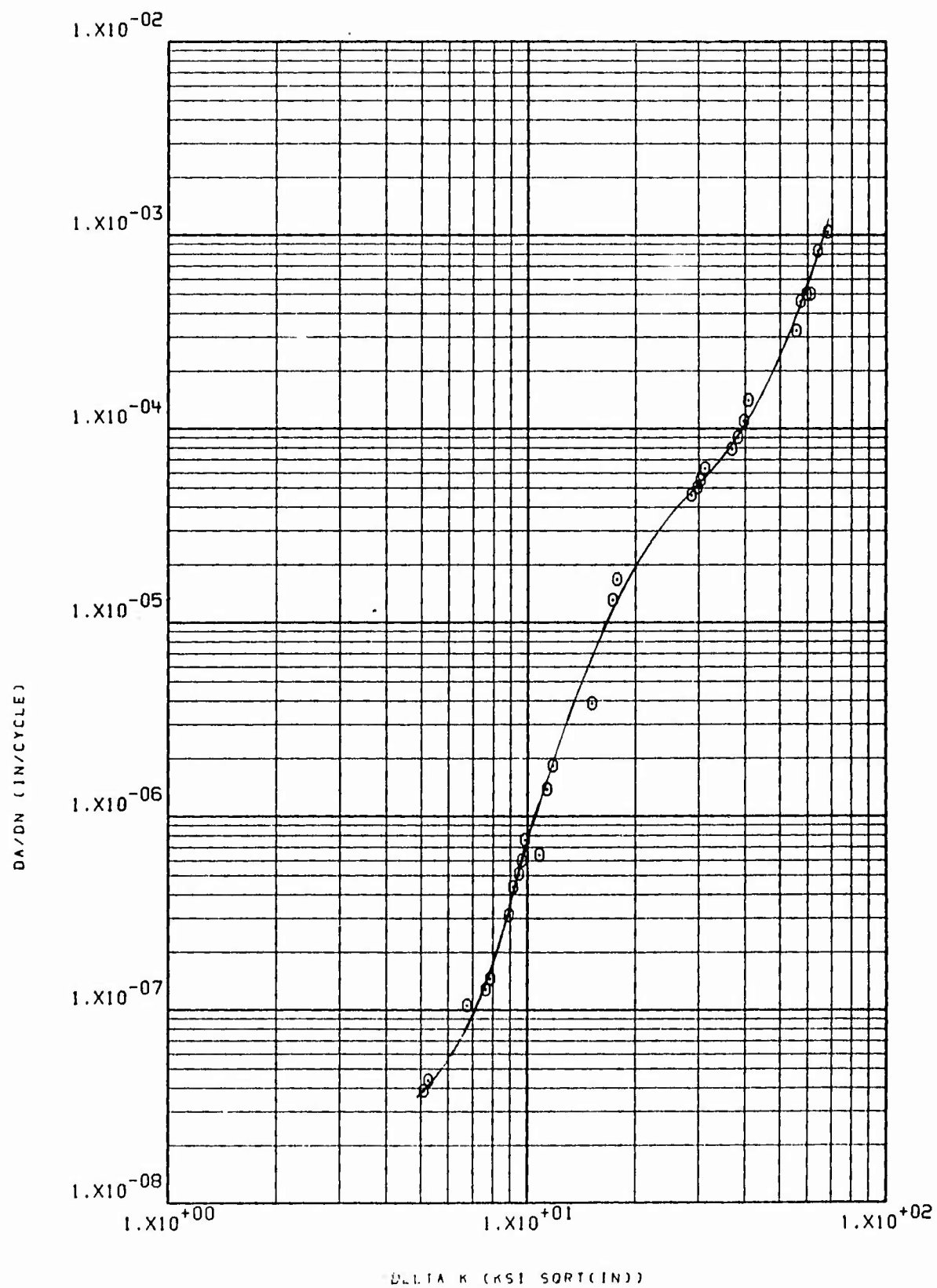
72 HPW 46-29 11 GAL-42 PA FUEL PT 60CPM P1.08



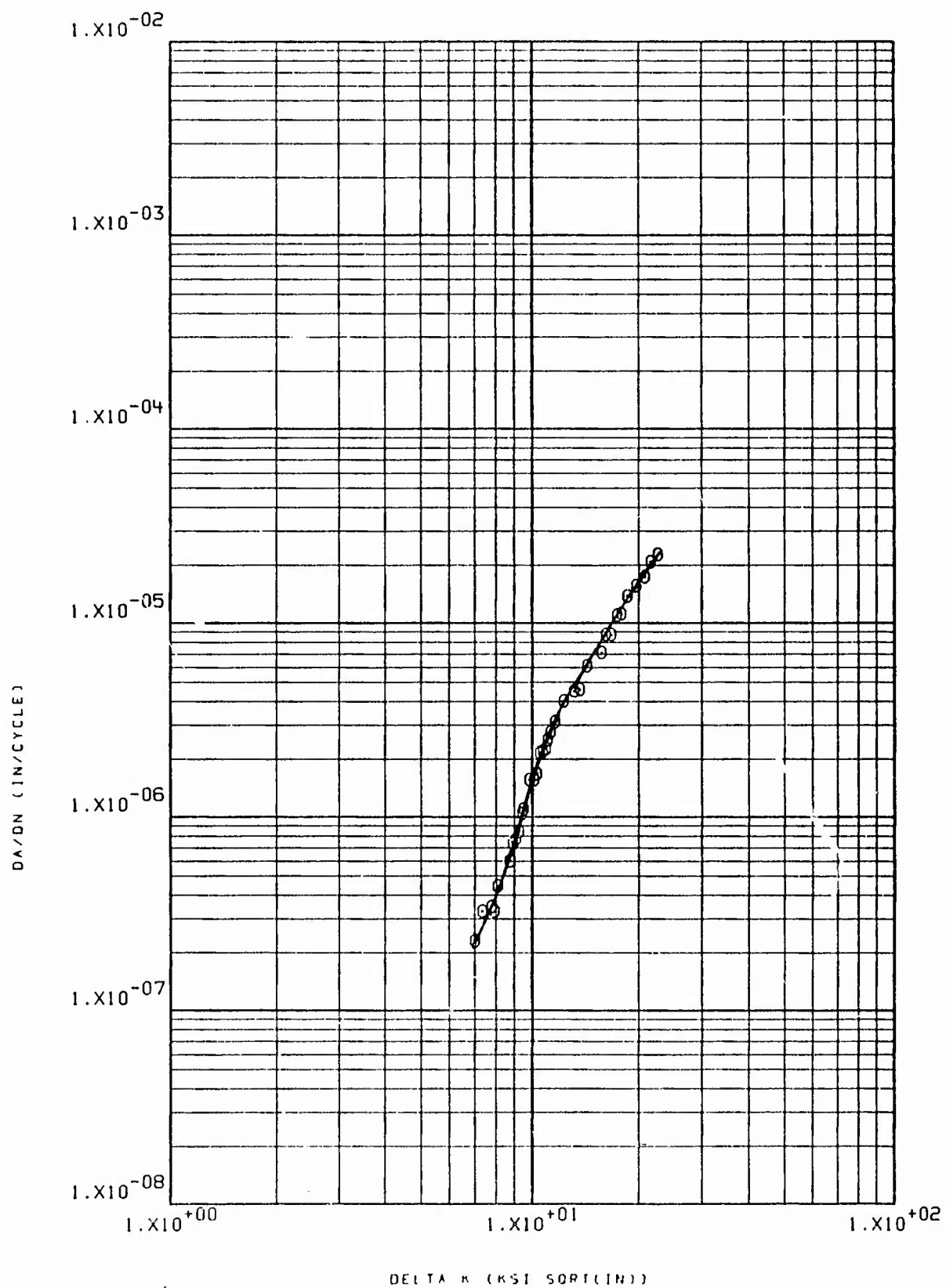
72 NR# 46-30 TI 6AL-4V RA 150F SUMP R-08 60CPH



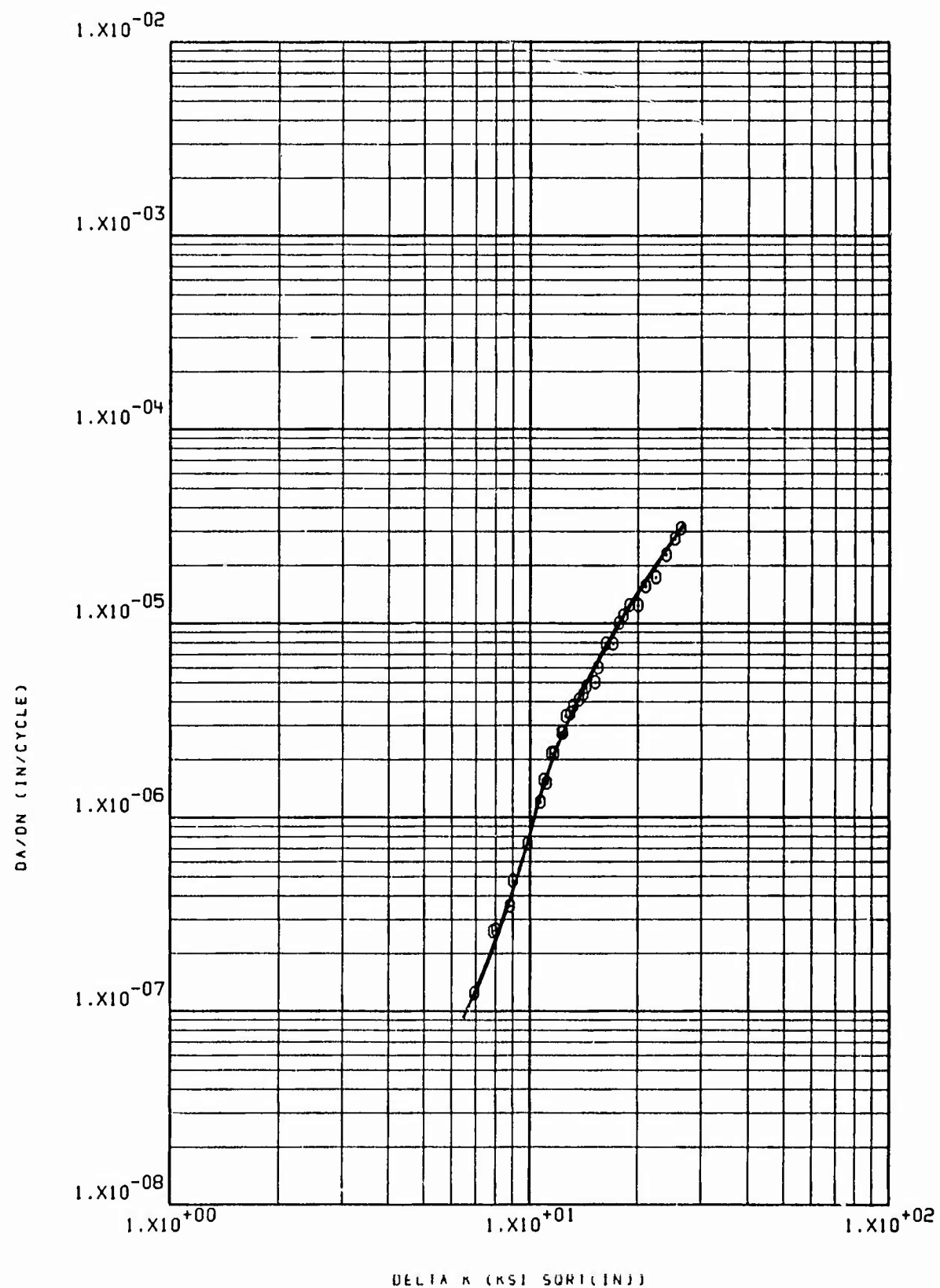
72 HPW 46-31 TI-6AL-4V PA SUMP RT 60CPM R=1.5



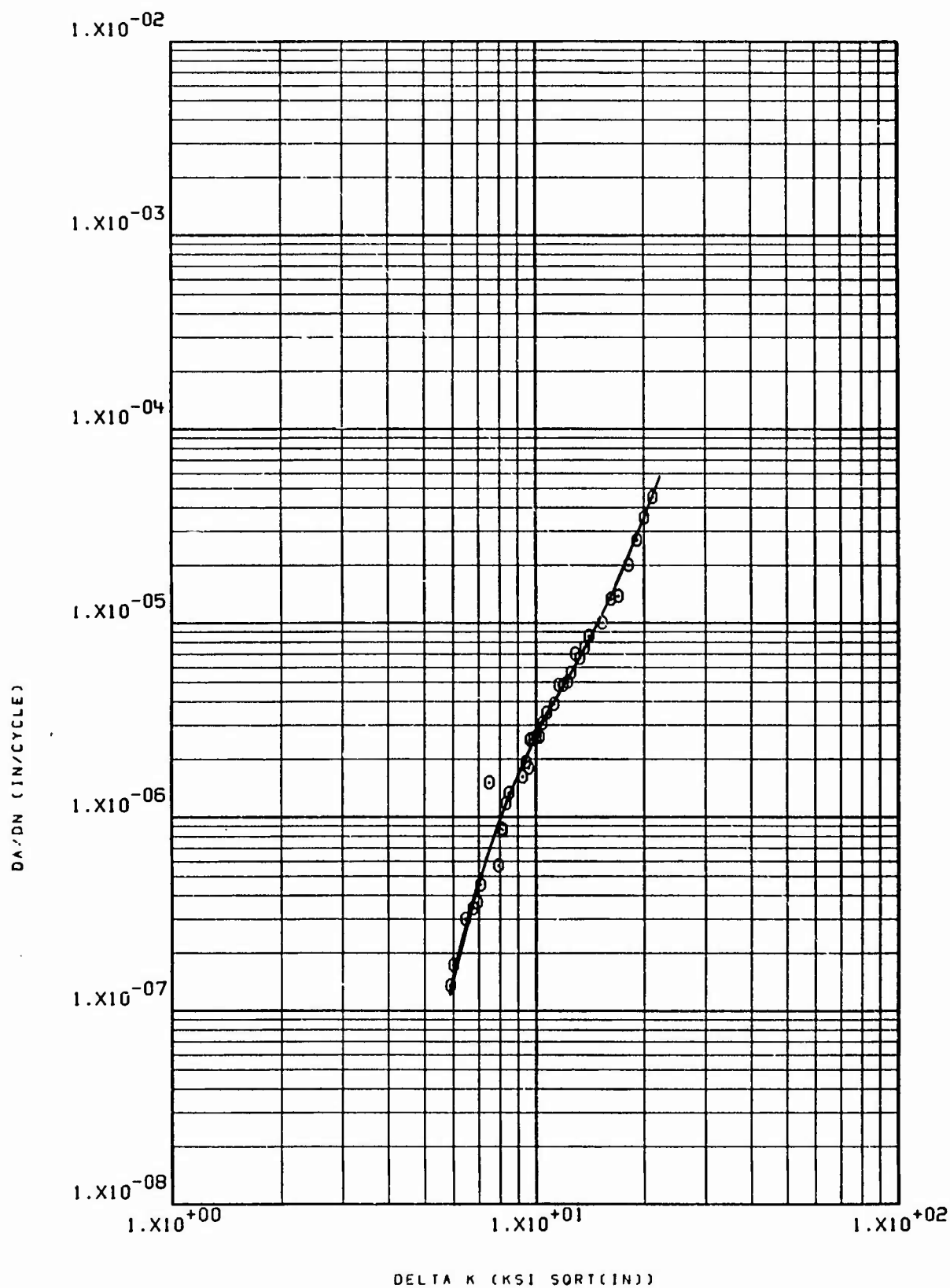
72 NFW 46-32 T1-BAL-4V PA GUMP R. I. 600PM R=1.08



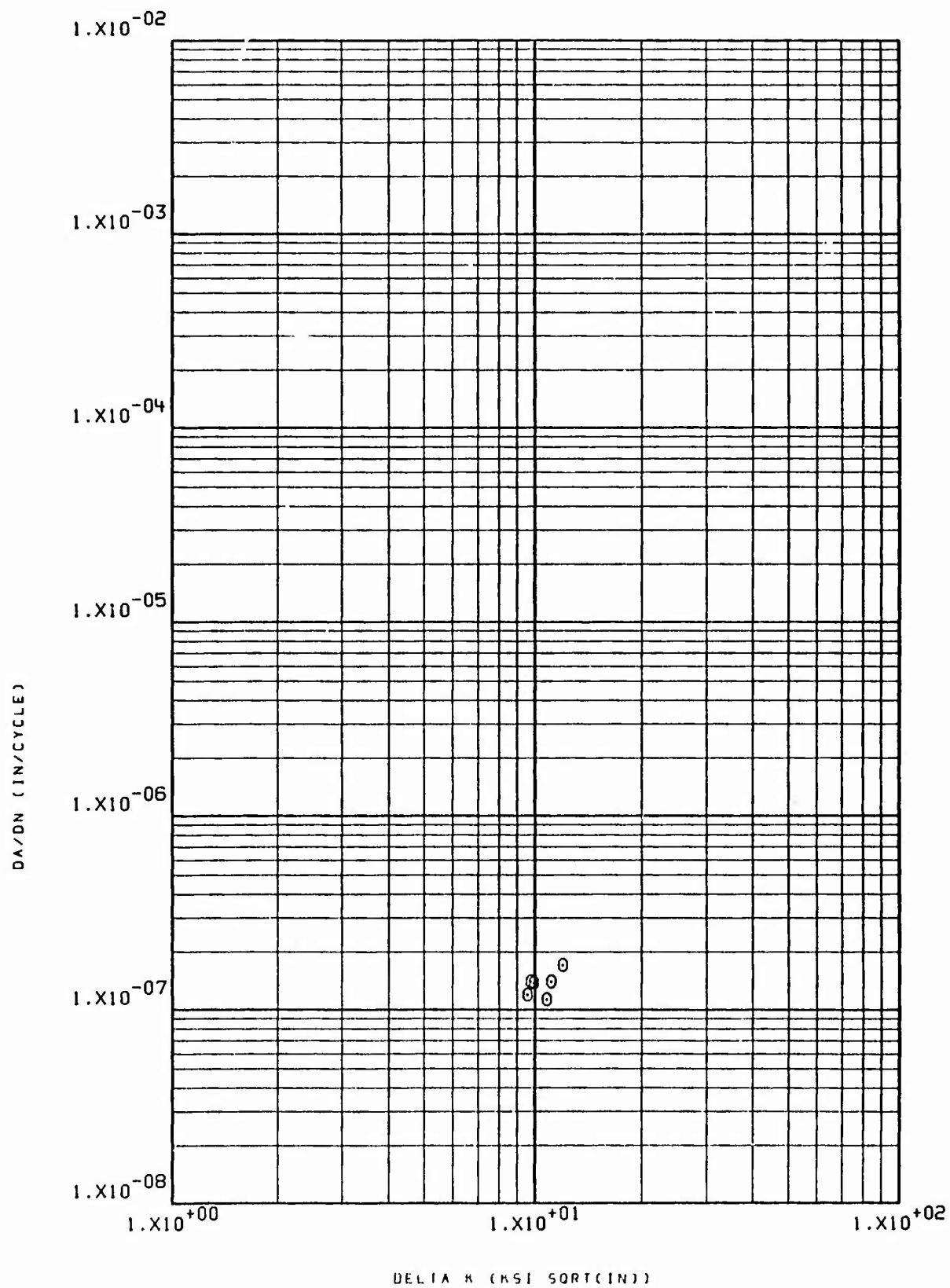
72 HPW 46-33 11 GAL 4V PA LHA RT P .5 360CPH



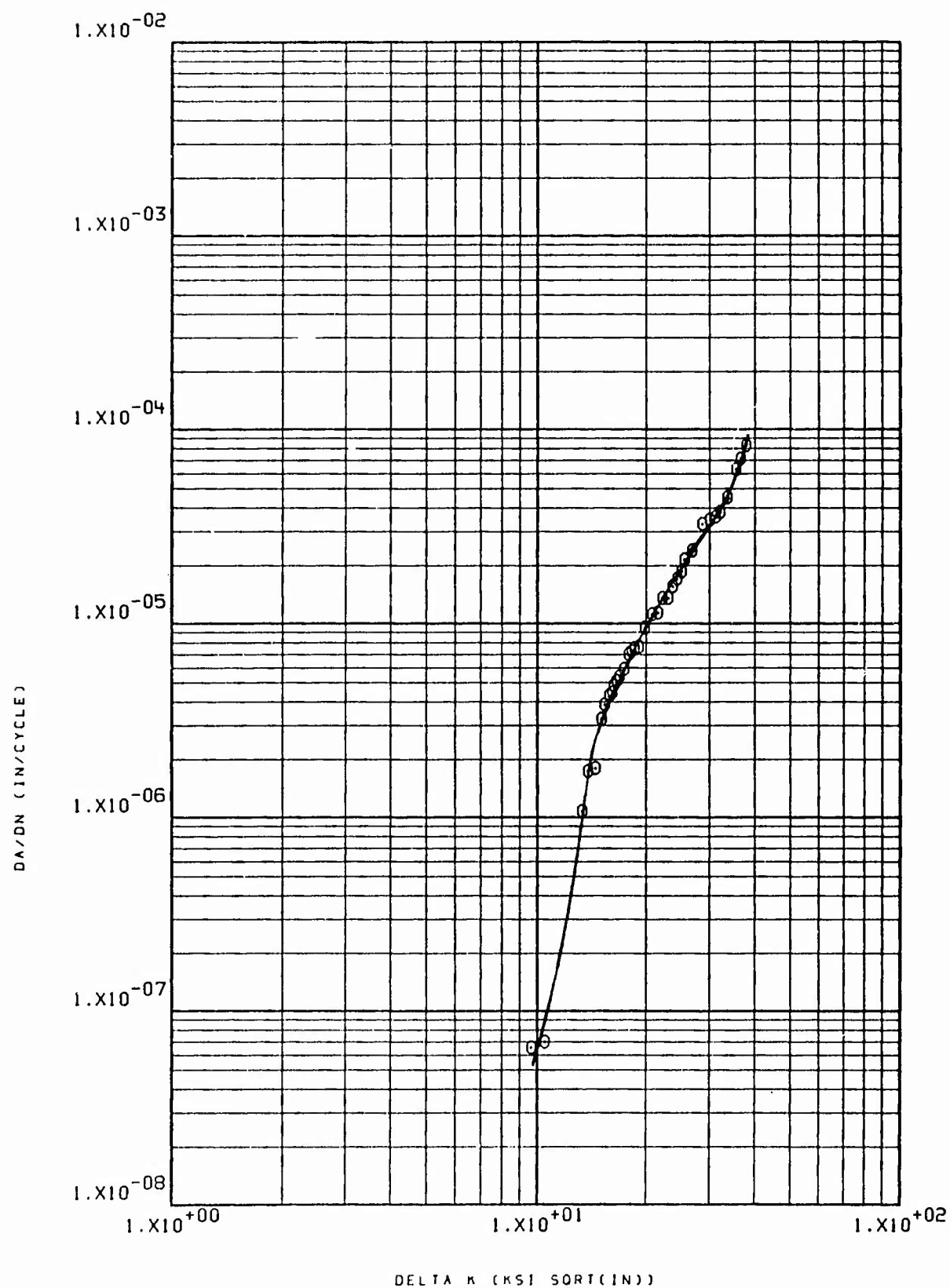
72 HPW 46-34 T1-6AL-4V RA LHA RT R=.3 360CPM



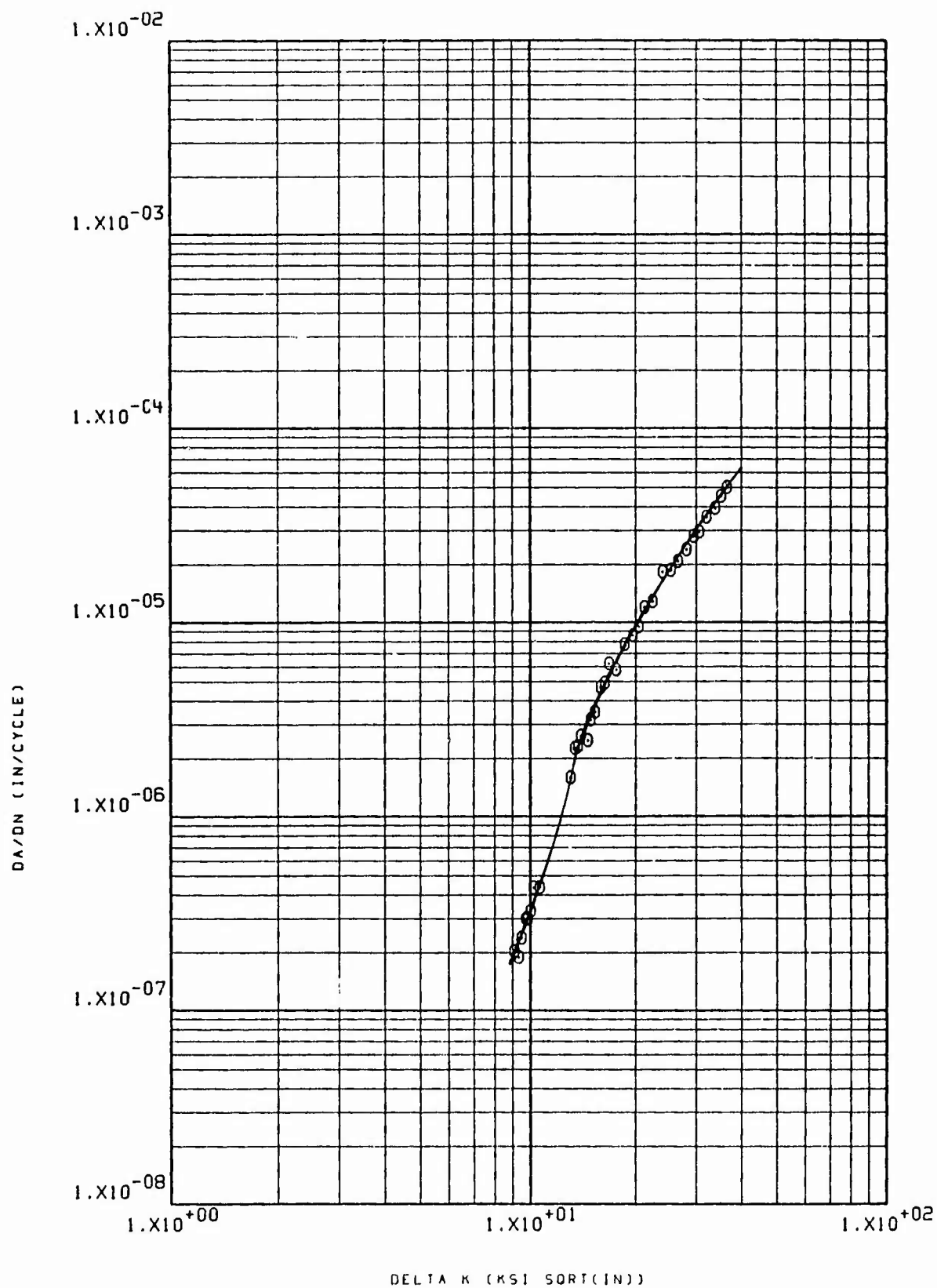
72 NPW 46-35 TI-6AL-4V RA LHA RT R=.7 360CPH



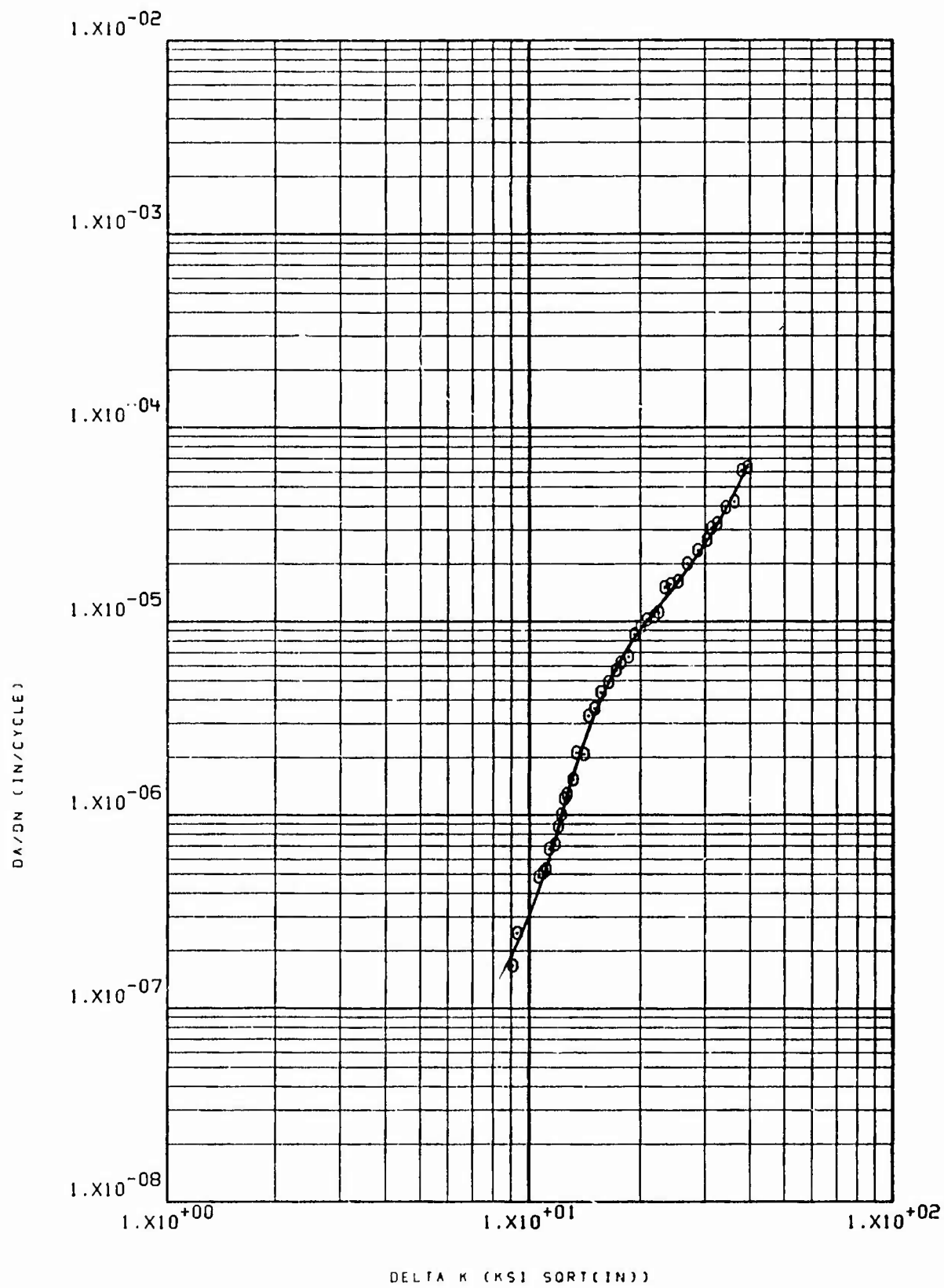
72 HRW 46-36 11 GAL-4V PA LHA 26°F CPM 360 R= .08



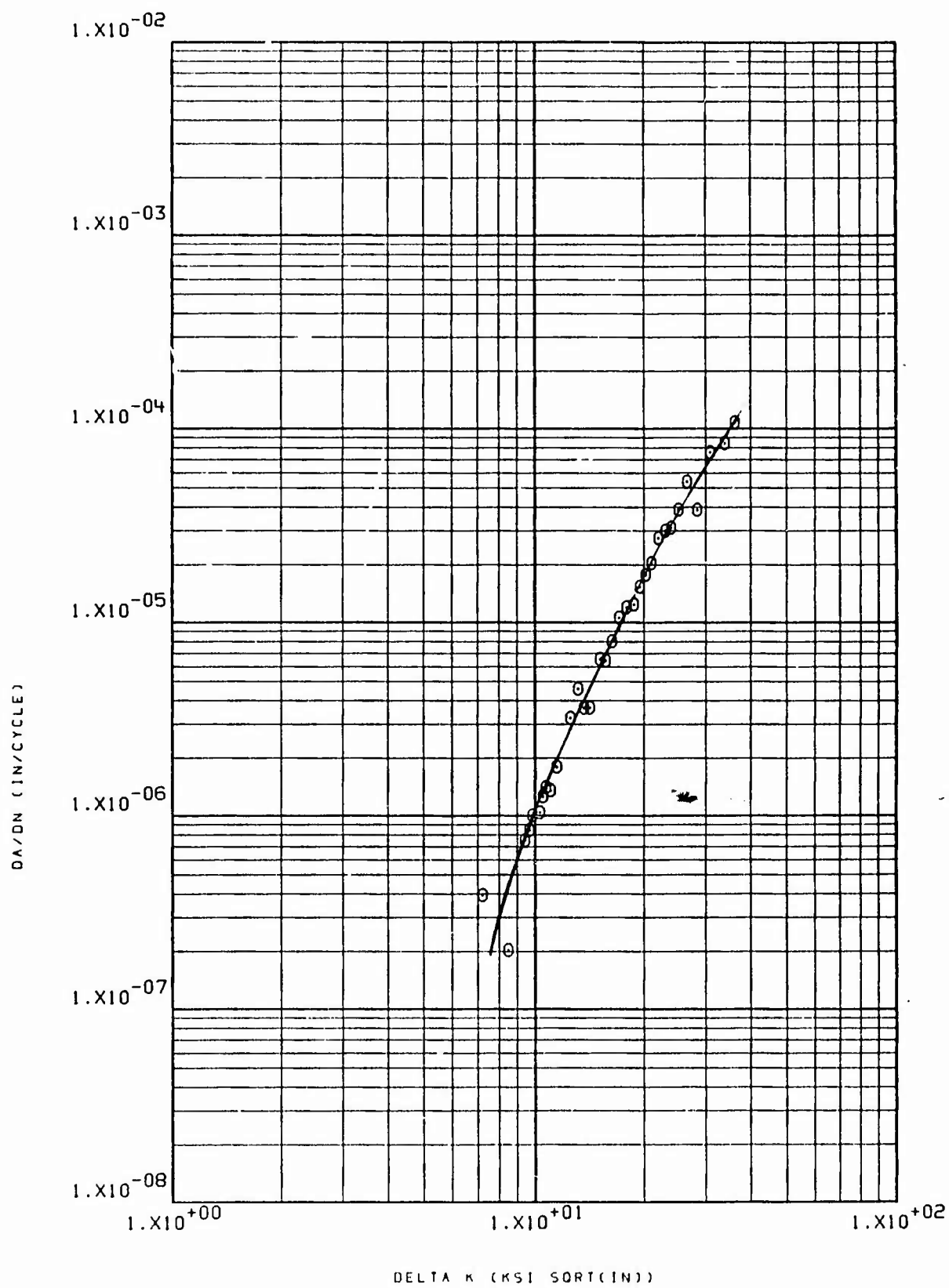
72 NPW 46-37 T1-6AL-4V RA LHA 65F 360CPM R=.08



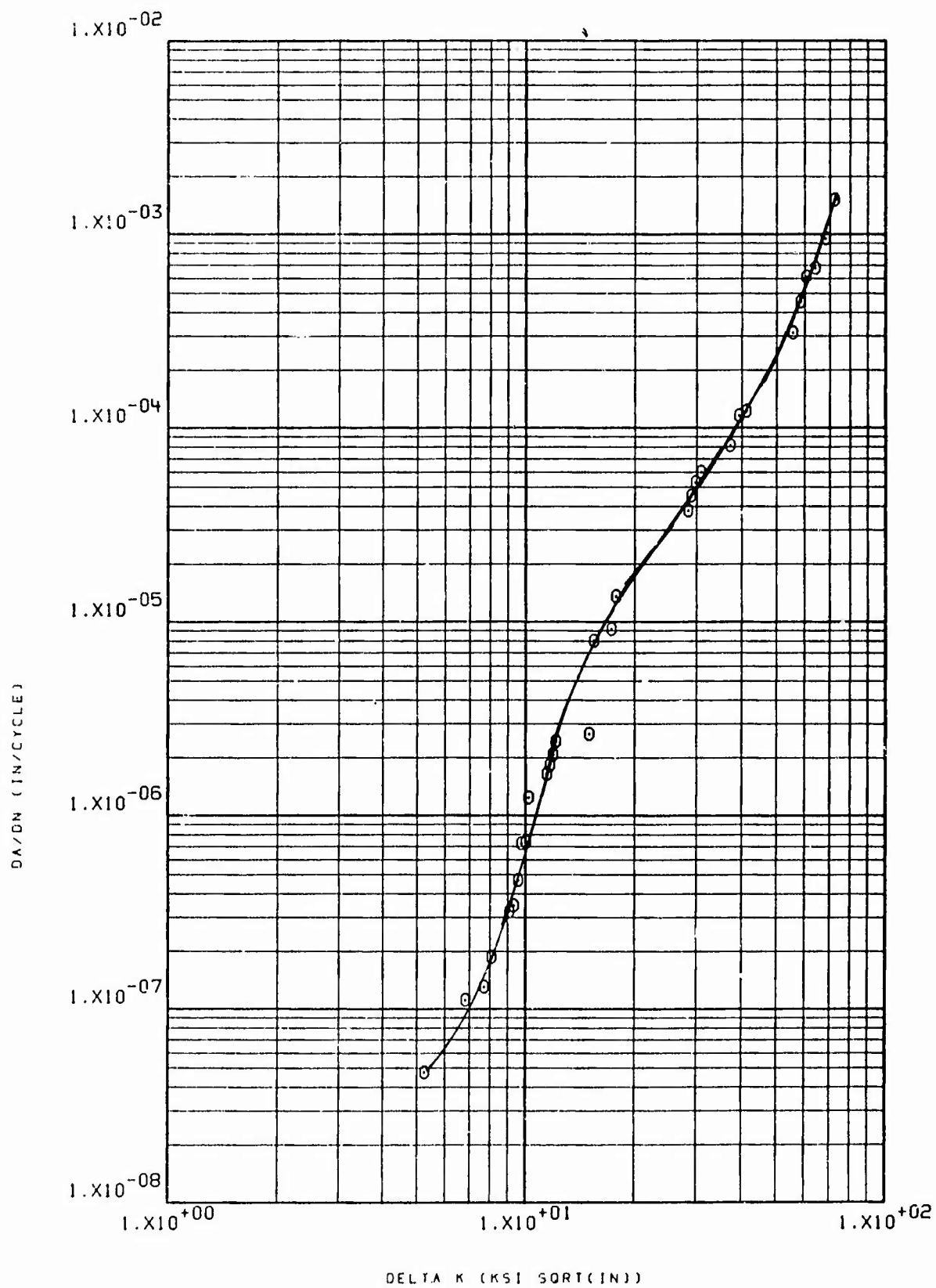
72 HPW 46-38 TI-6AL-4V RA LHA RT 360CPM R=.08



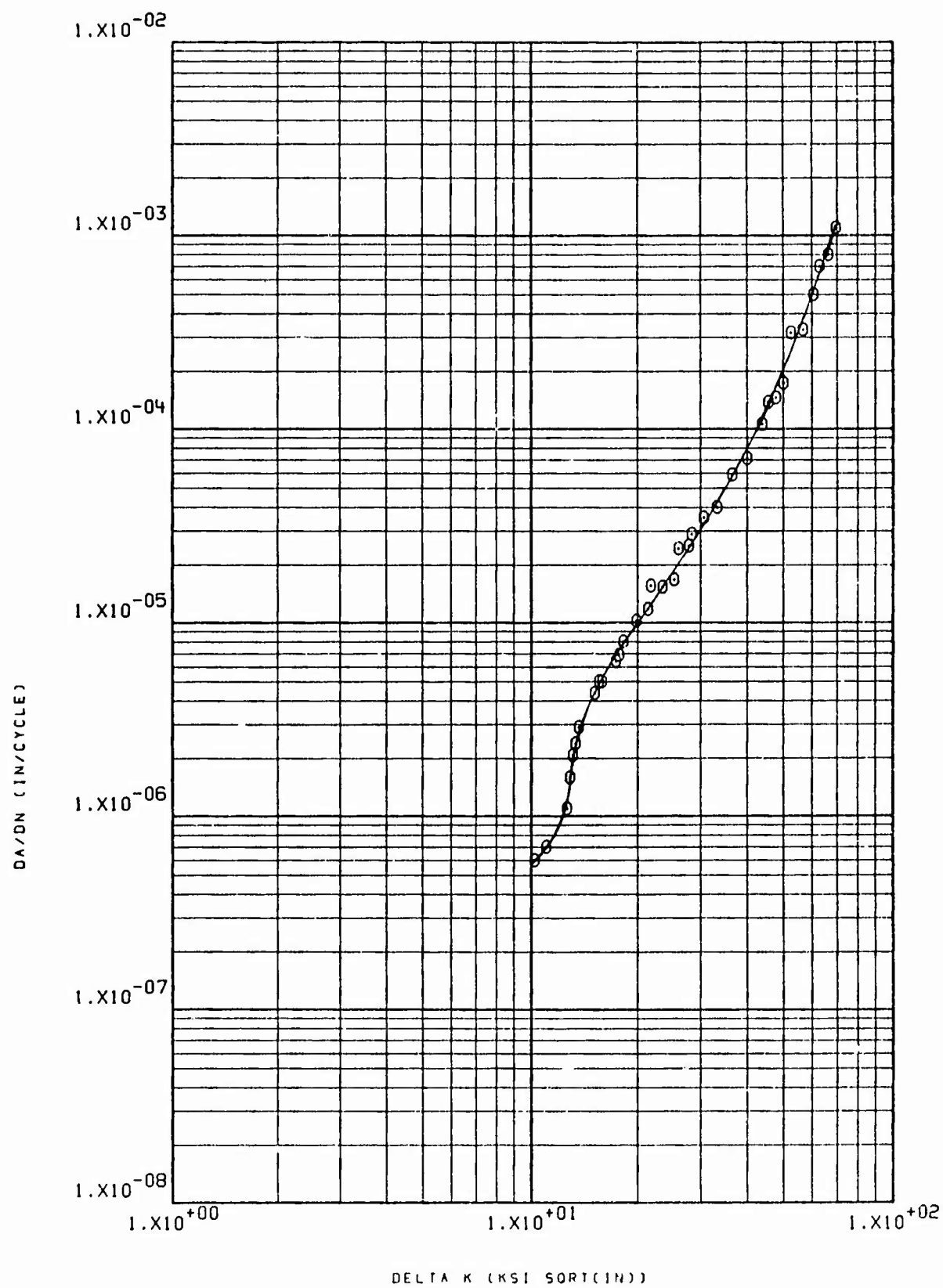
72 NPW 46-39 TI 6AL-4V PA LHA RT 360CPM R=.08



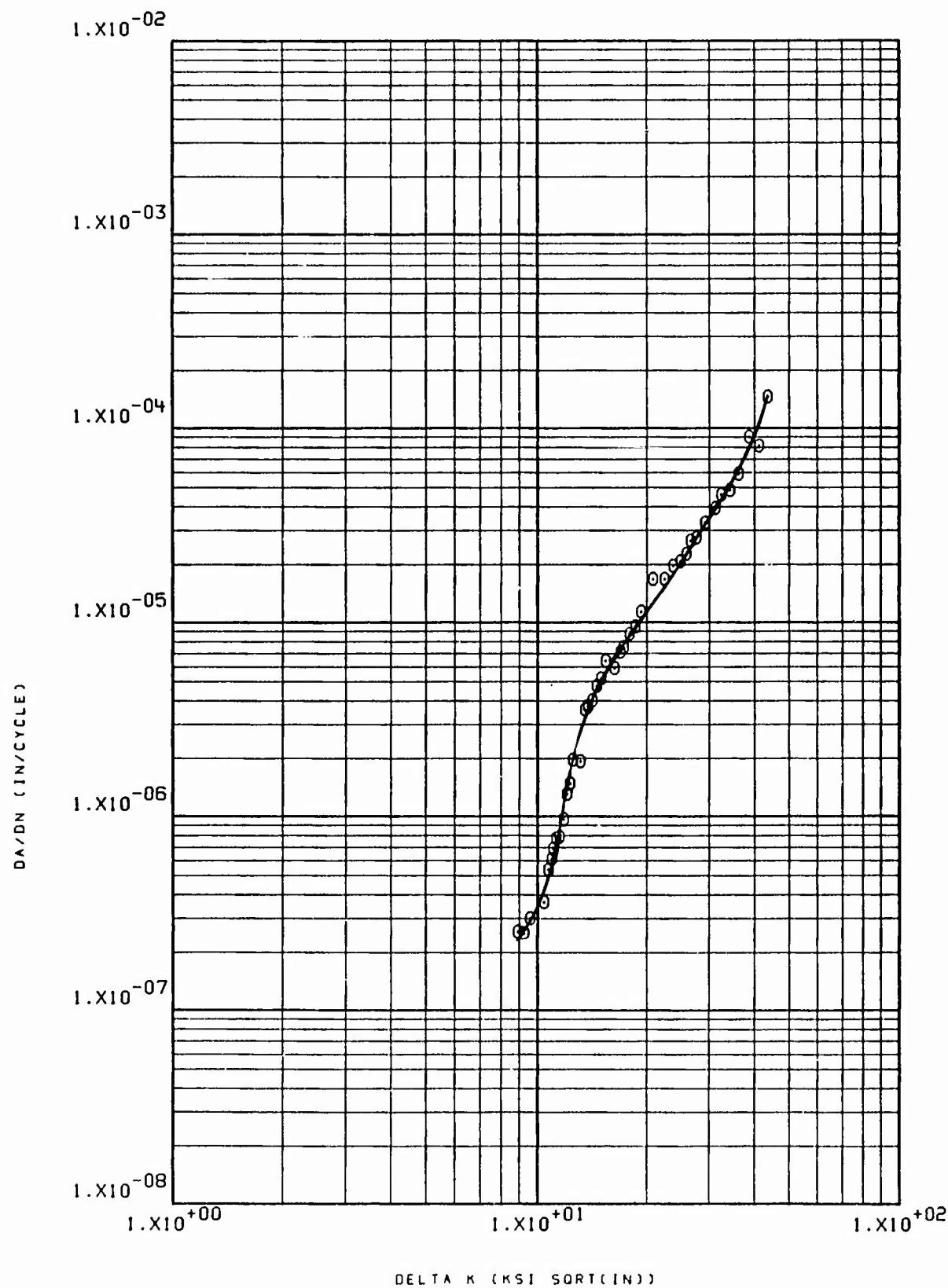
72 NWR 46-40 TI GAL-47 DBTC SUMO PT GLEPM R=.08



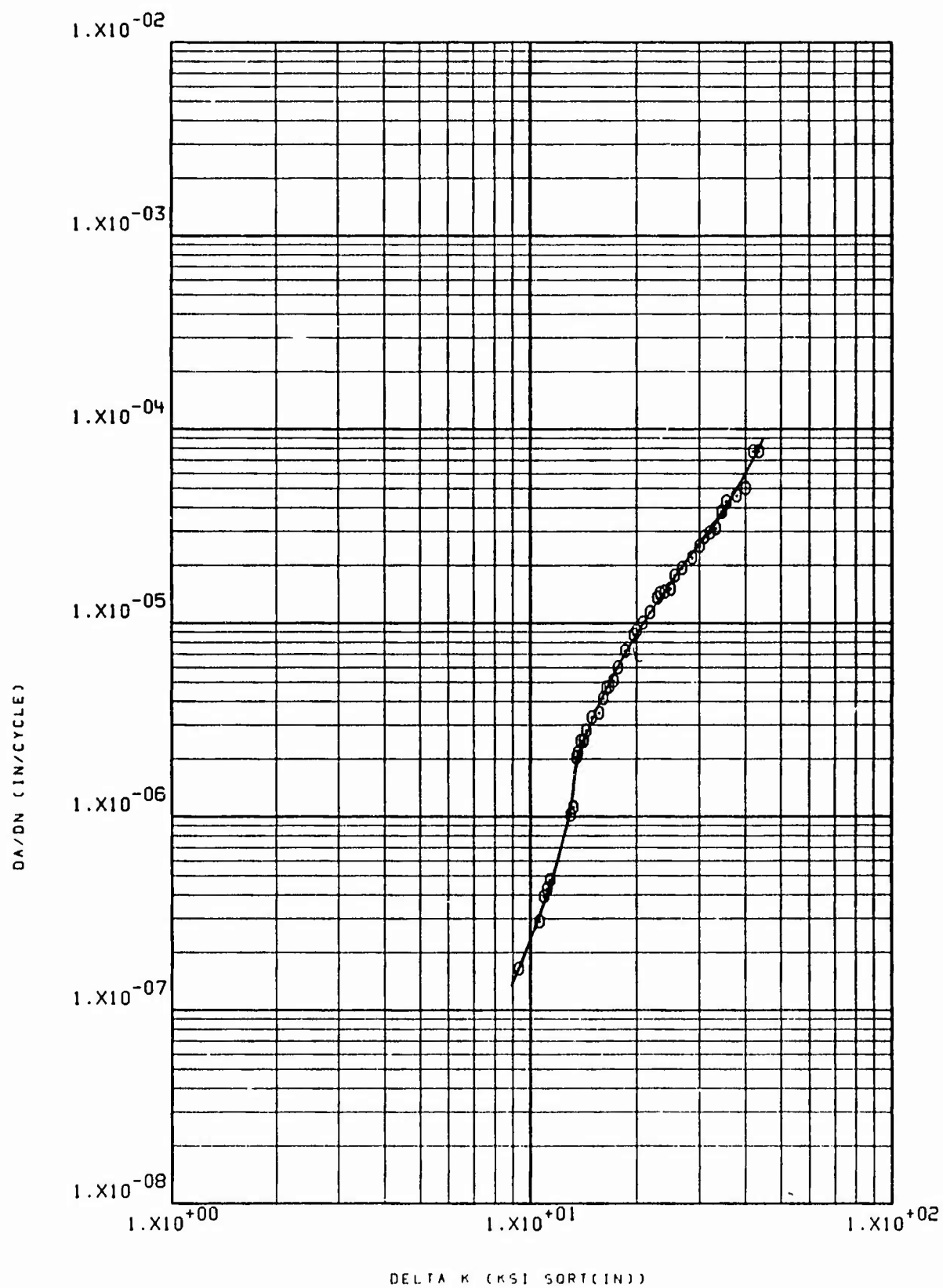
72 NWP 46-41 11-6AL 4V RA SUMP RT R=0.08 60CPM



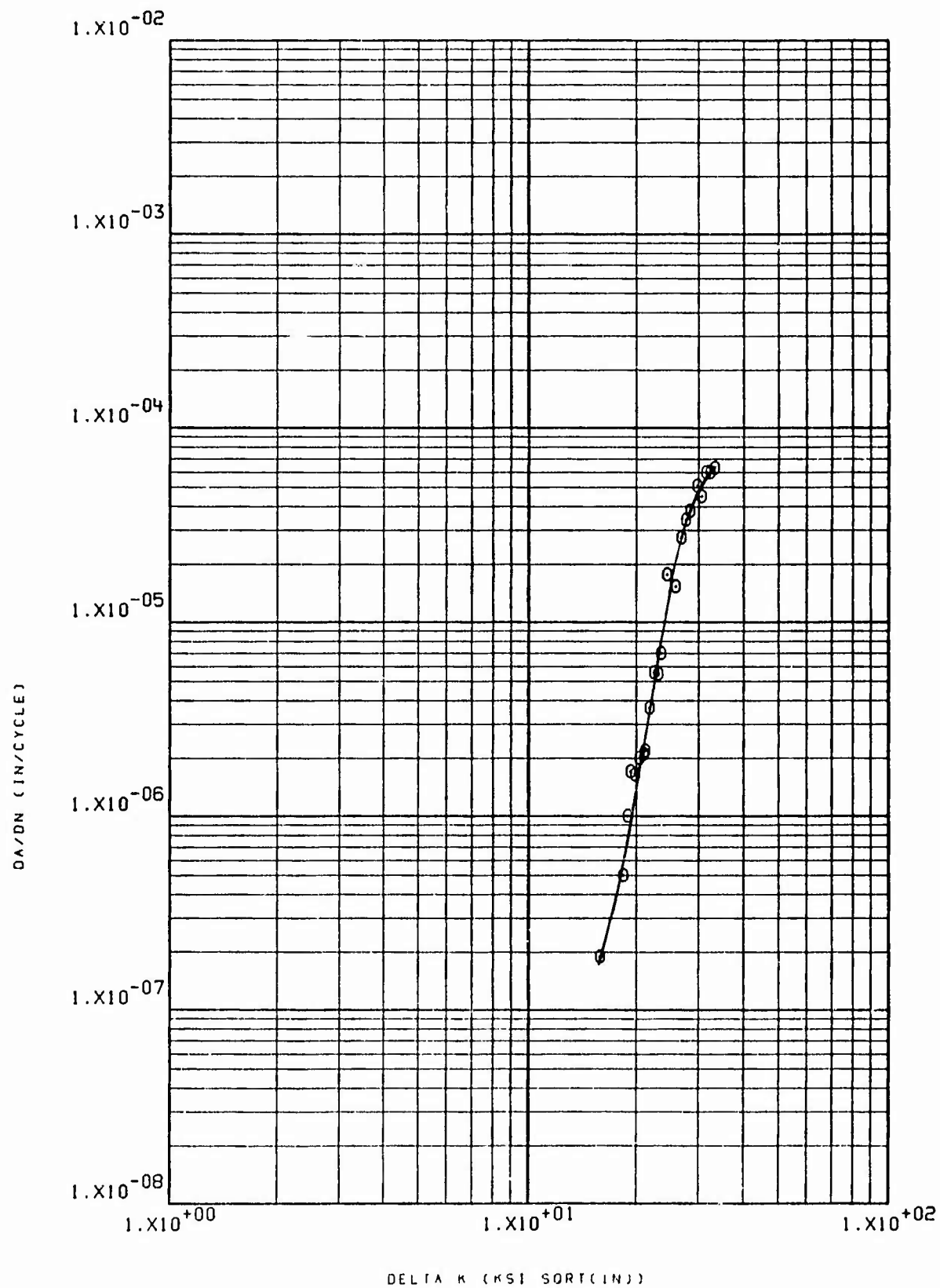
72 HWR 46-42 II 6-AL-4V RA LHA RT P=.08 360CPH



72 H.P. 46-43 TI-6AL-4V RA FUEL PT 600PM R+.08

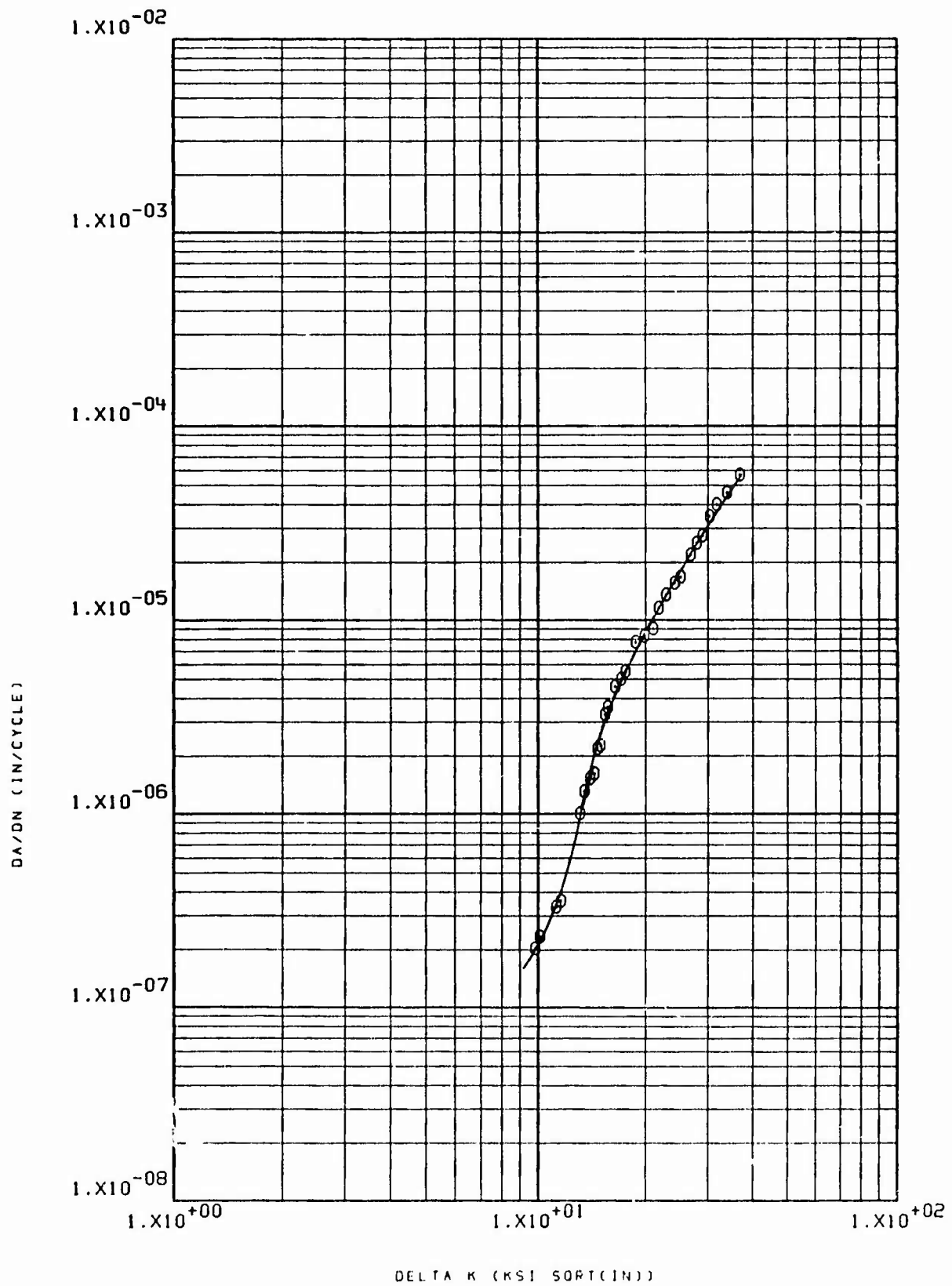


72 IWR 46 44 11 GAL 4V PA LHA PT 360CPH R=.08



72 HPW 40-79 T1 6Al-4V

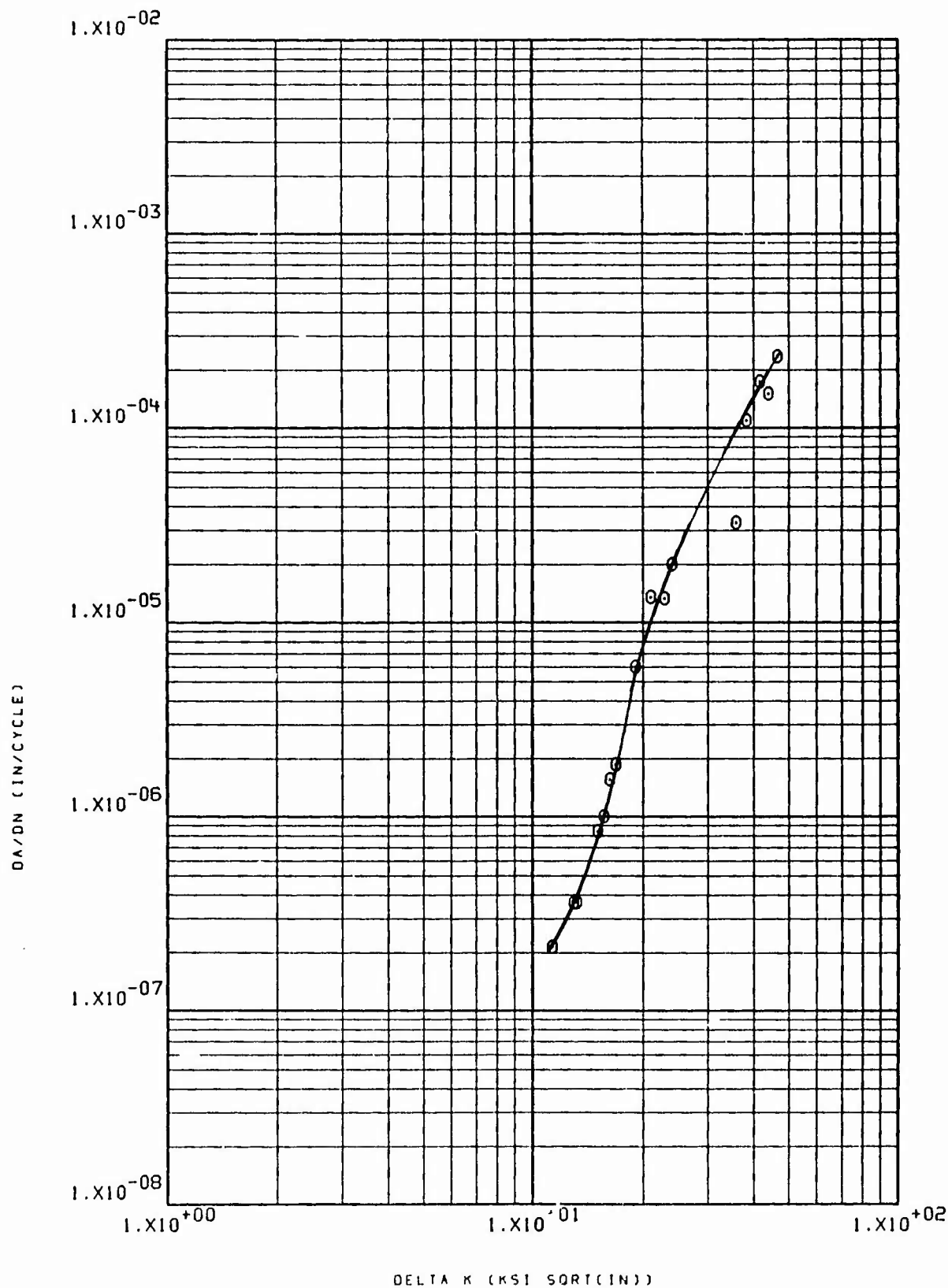
RA 5TW RT R=.08 60CPM



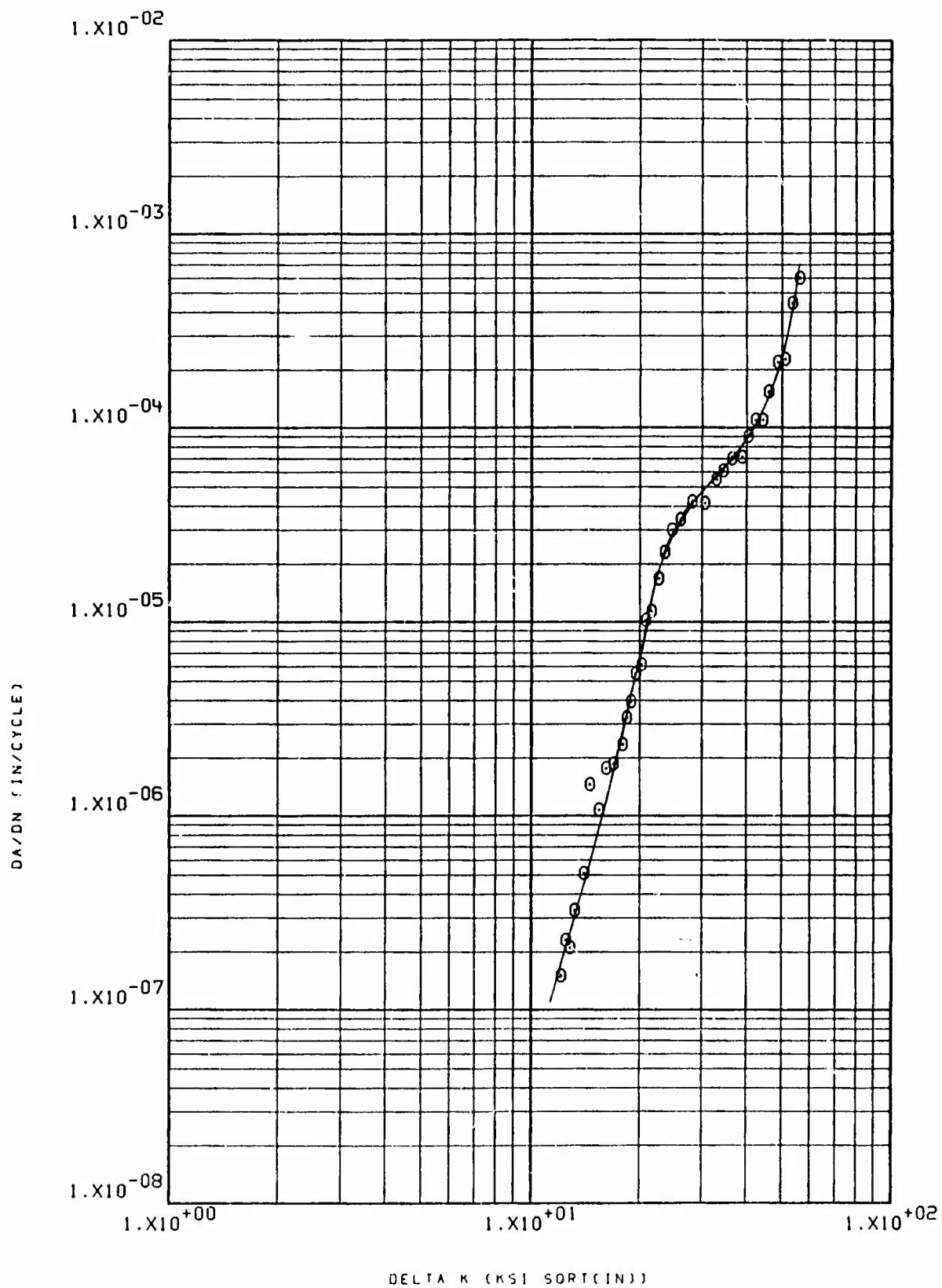
74 MTW/TW 52-1 11-6AL-4V DB

LHA

RT 360CPH R=.08

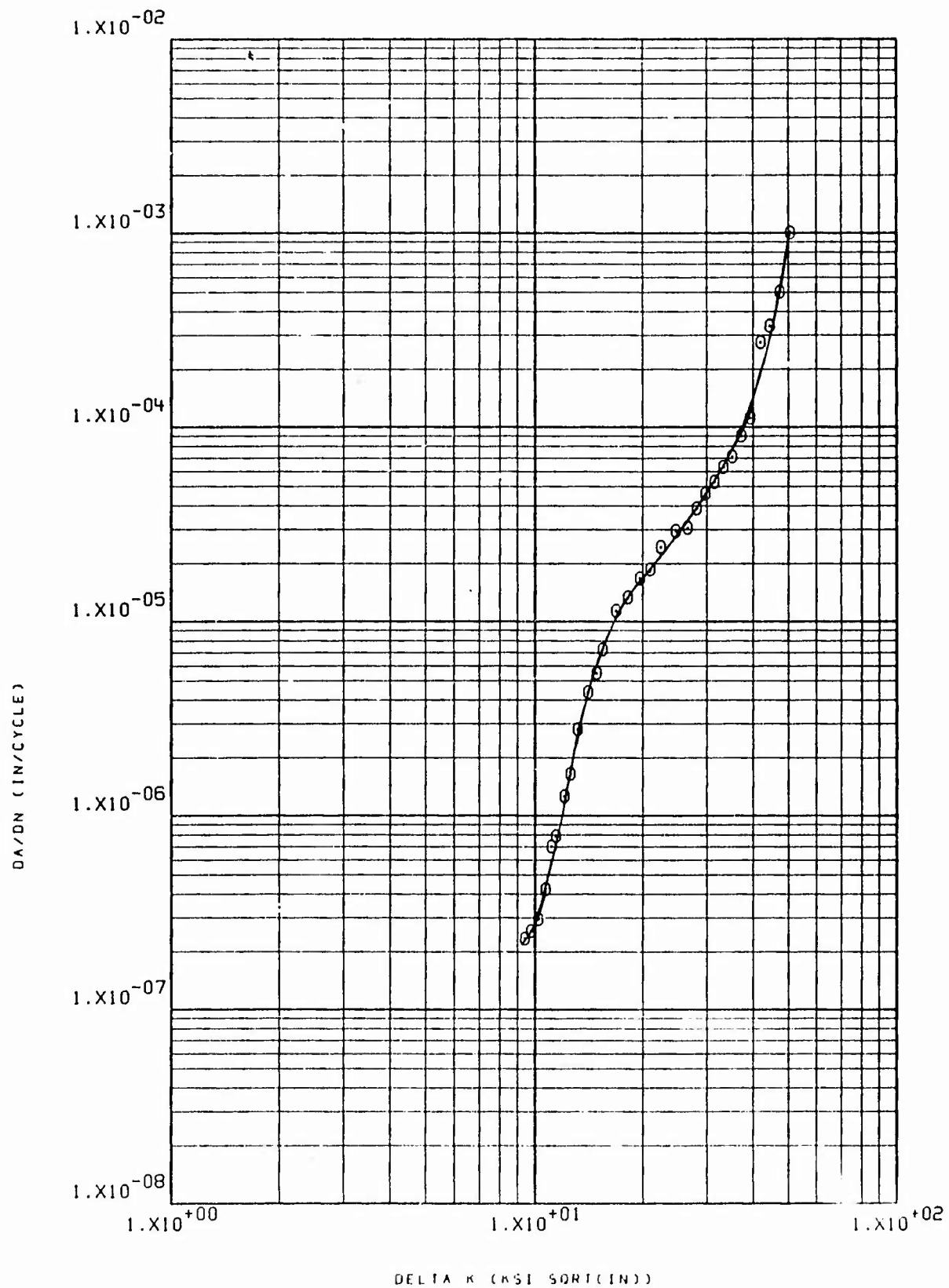


74 HTW 52-2 T1-6AL-4V DB STW RT R=.08 60CPM



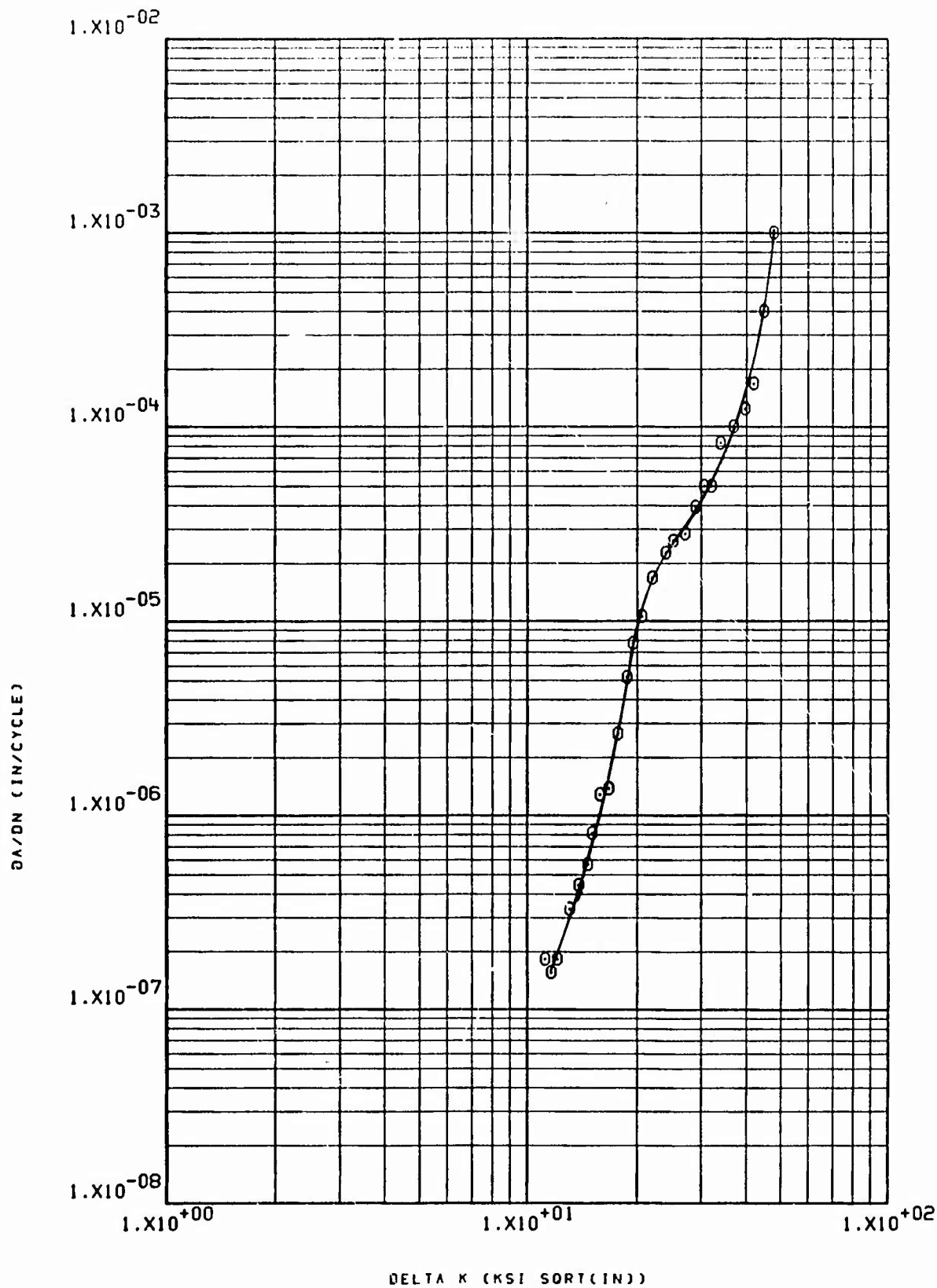
74 NWP 52-3 11 GAL 4V DB

SUMP RT 60CPM R=1.08



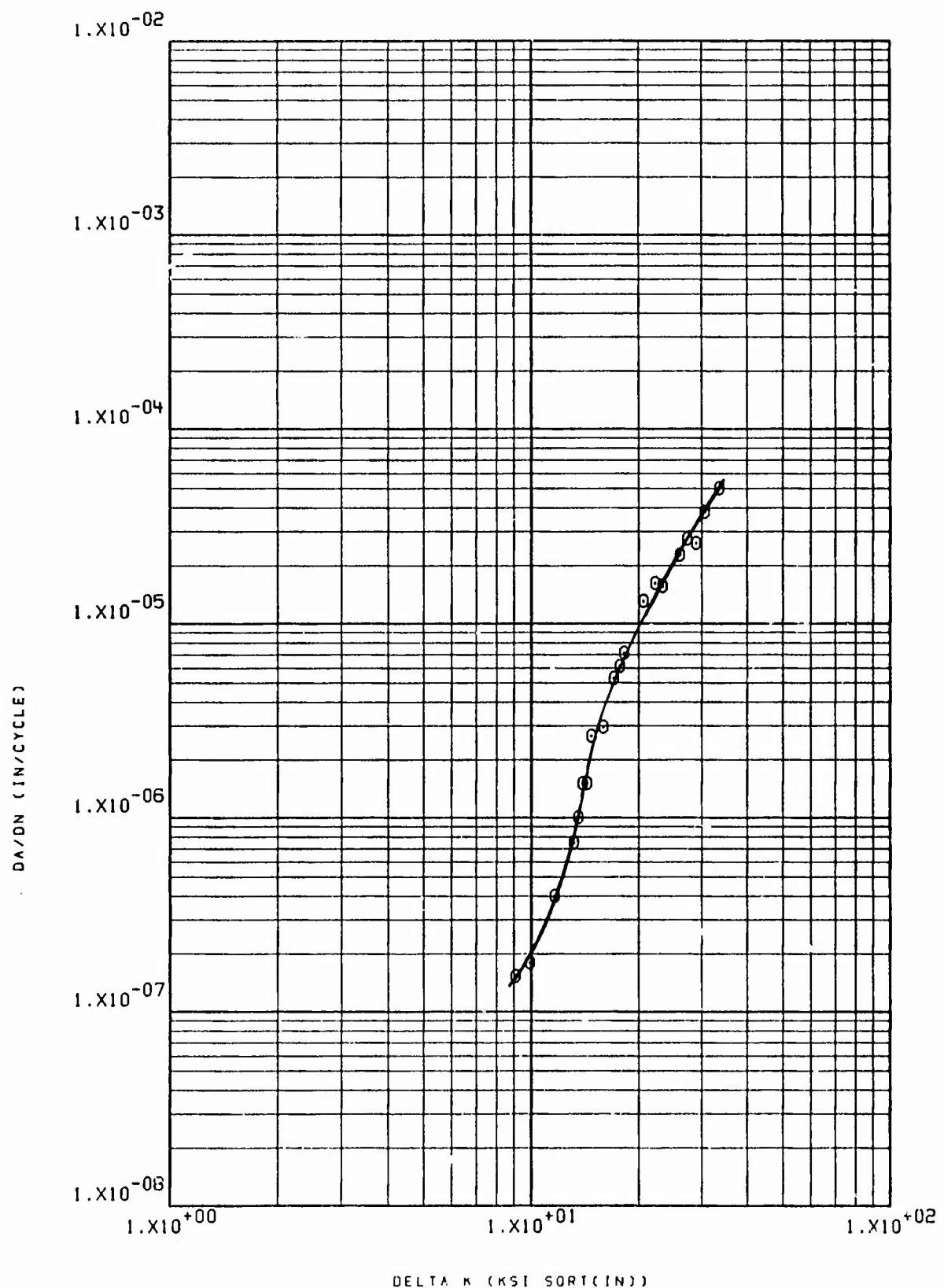
74 NTW/TW 52 20 11-GAL 4V DB

SUMP RT 60CPH R=.08

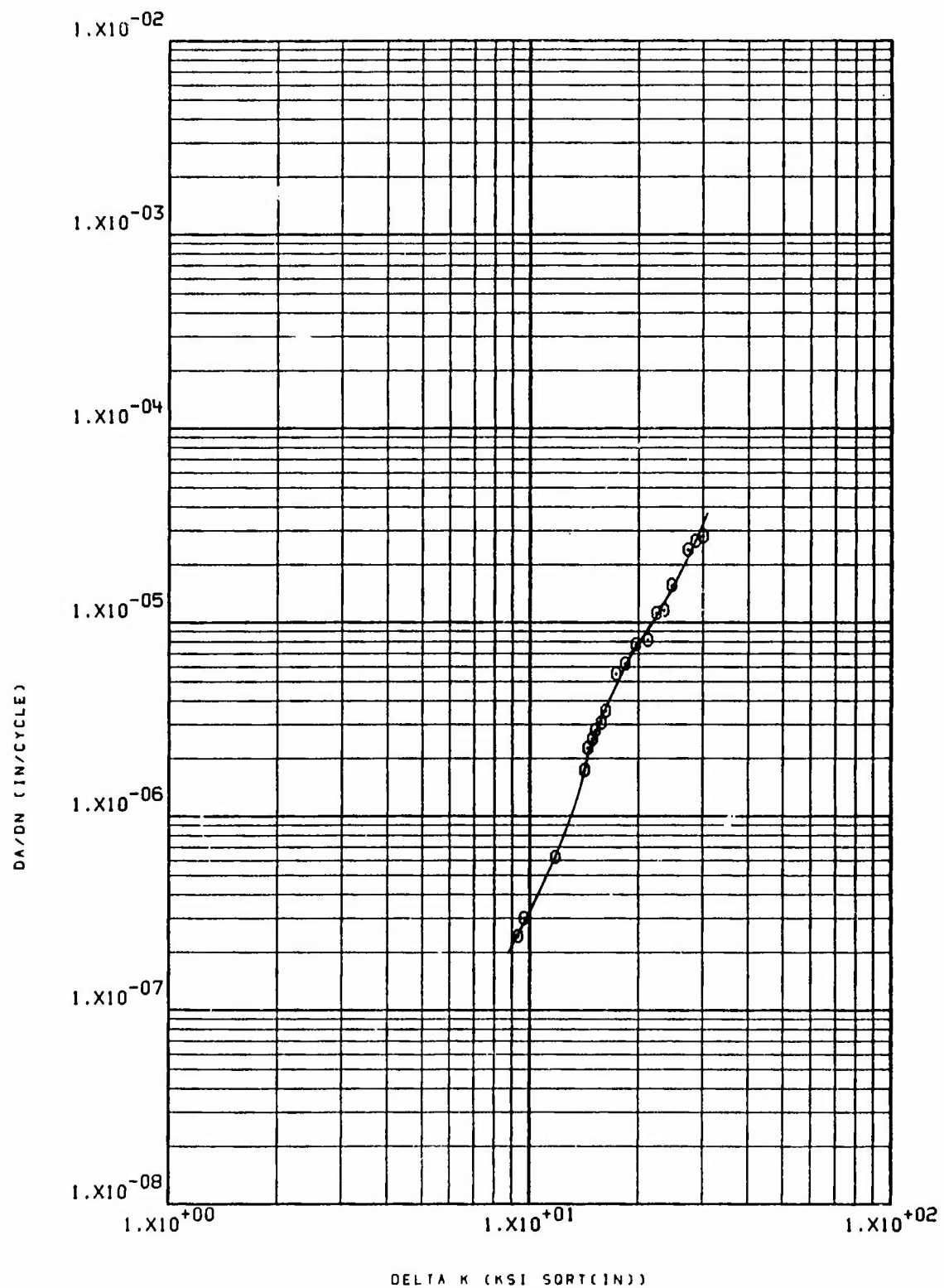


74 N1W 52-21 11-6AL-4V DB + TR

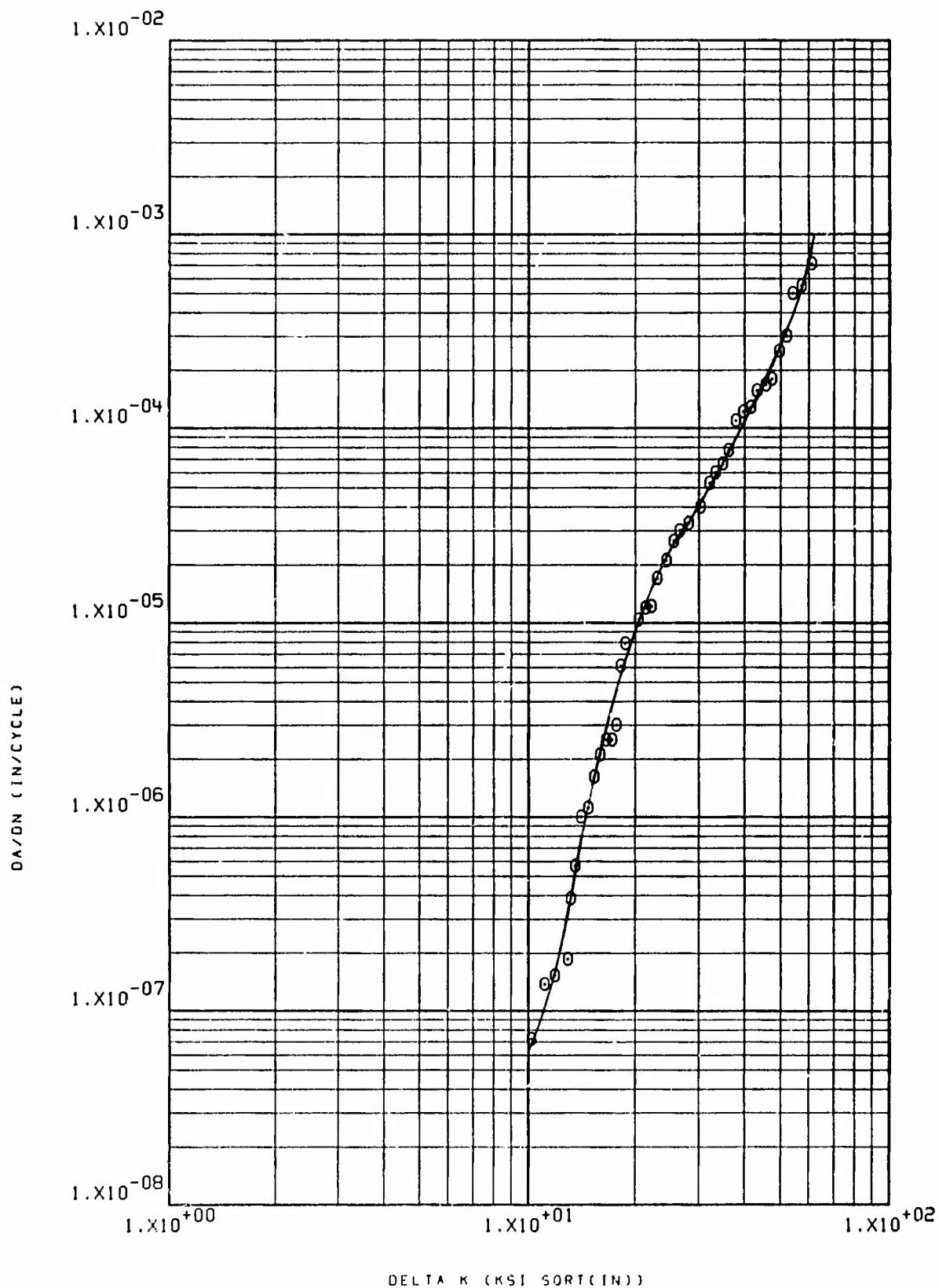
STW RT R=0.08 60CPH



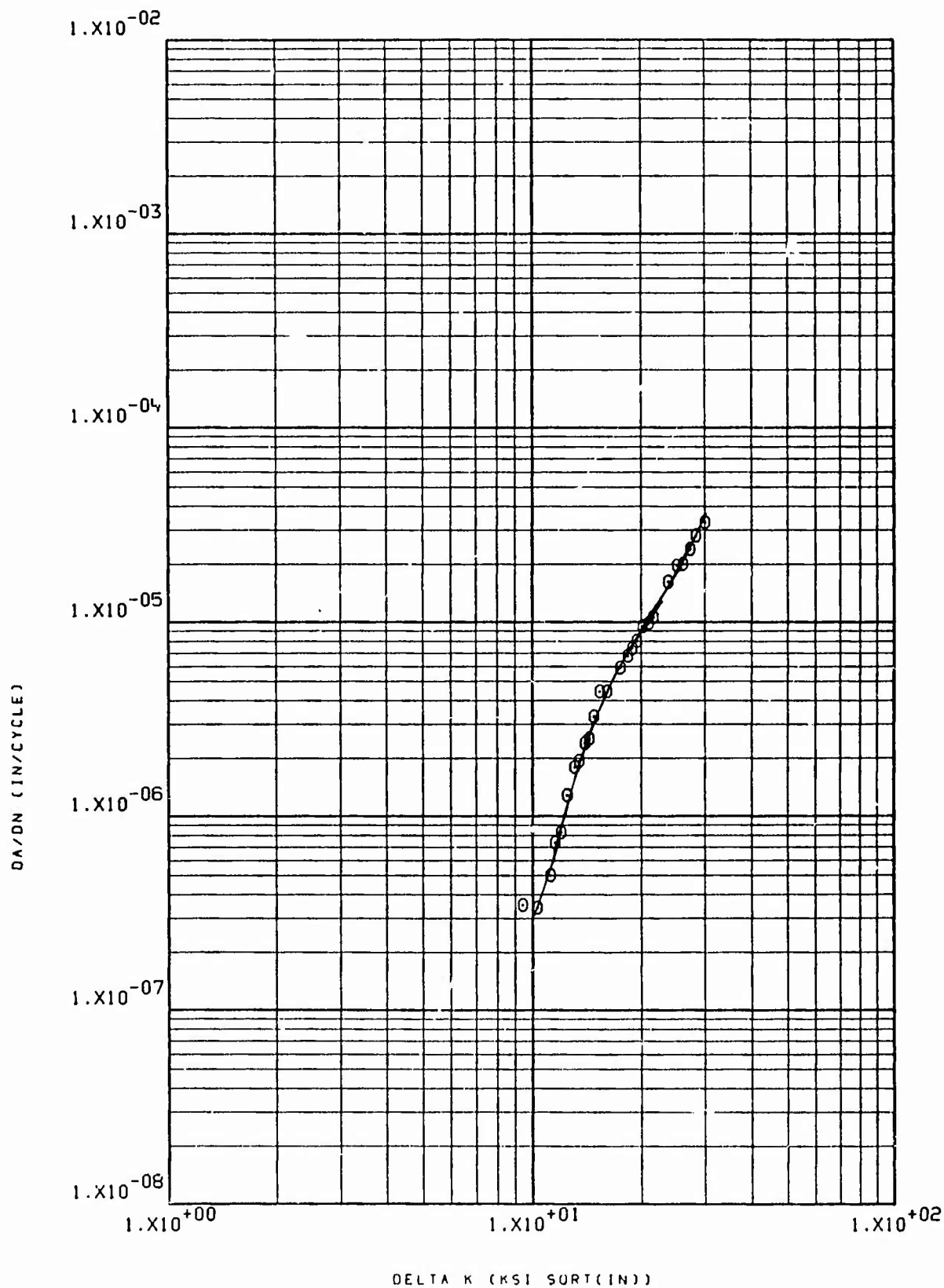
74 HWP 52-22 11-GAL-4V DB LHA RT R=.08 360CPH



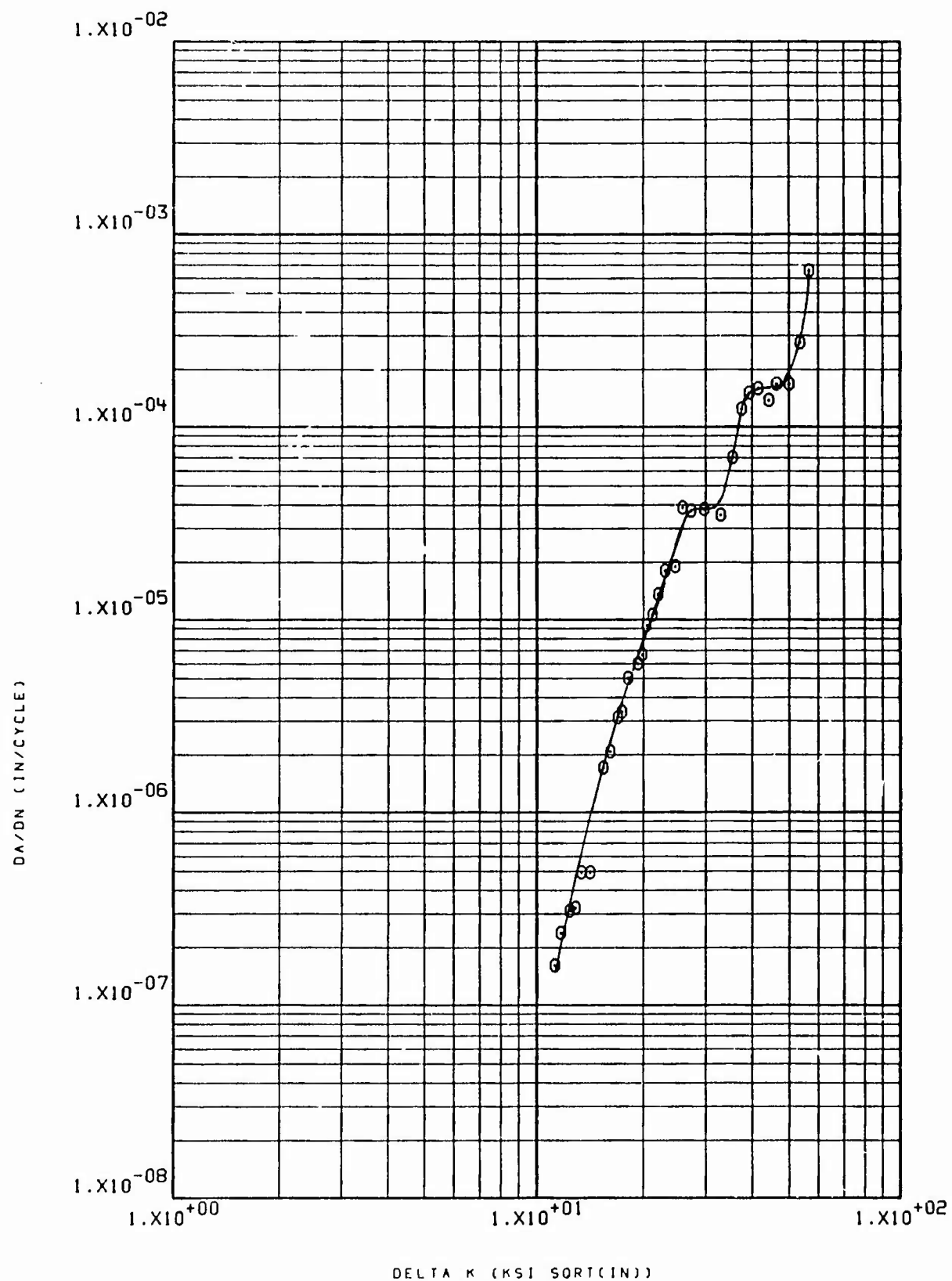
74 HTW/TW 53-1A T1-6AL-4V DB + 2DBTC LHA RT 360CPM R=.08



74 N4P 53-3 11-GAL-4V DB + 2DBTC SUMP RT 60CPM R1.08

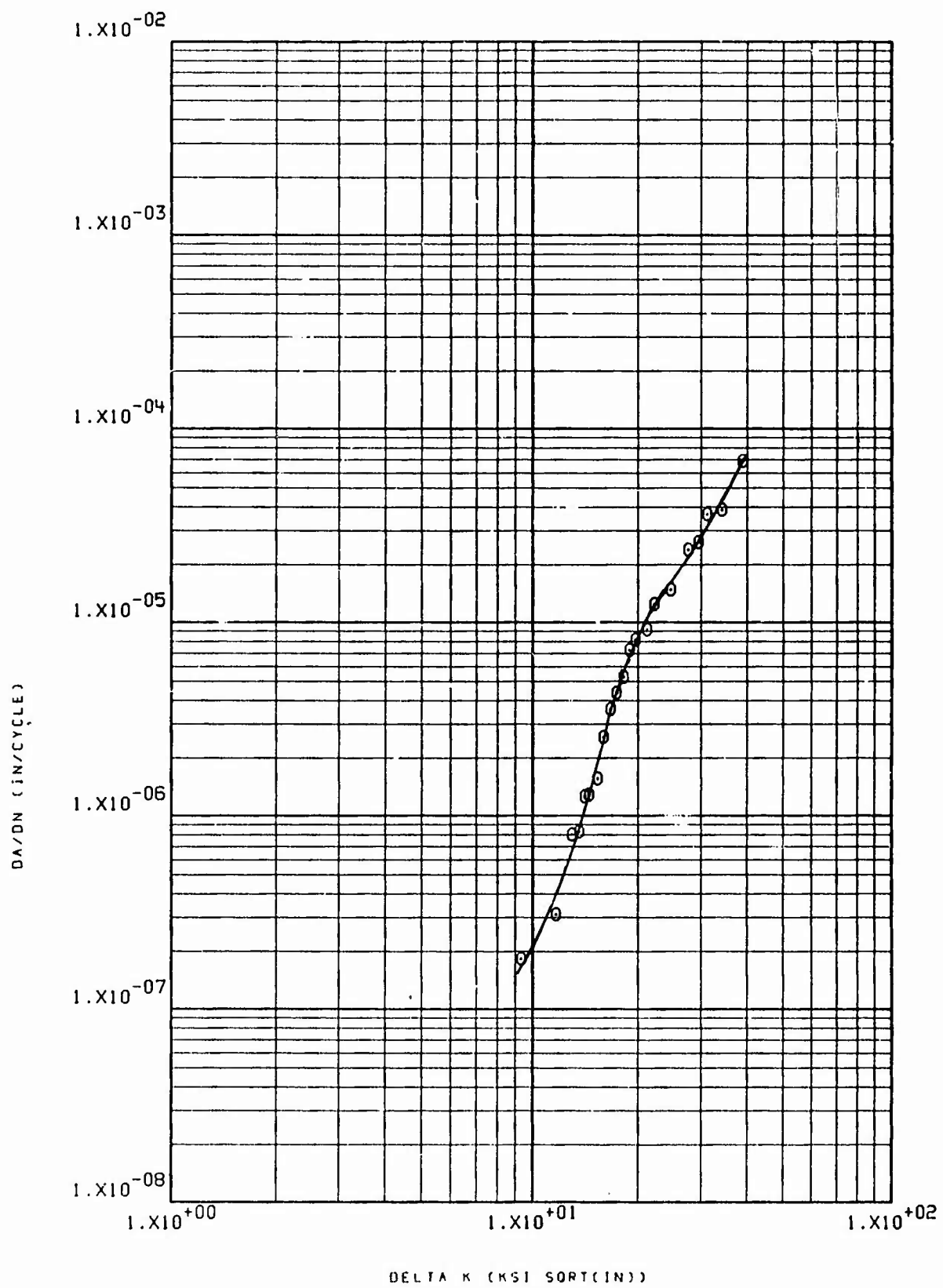


74 NTW/TW 54-1 TI-6AL-4V DB + 4DBTC LHA RT 360CPM R=.08



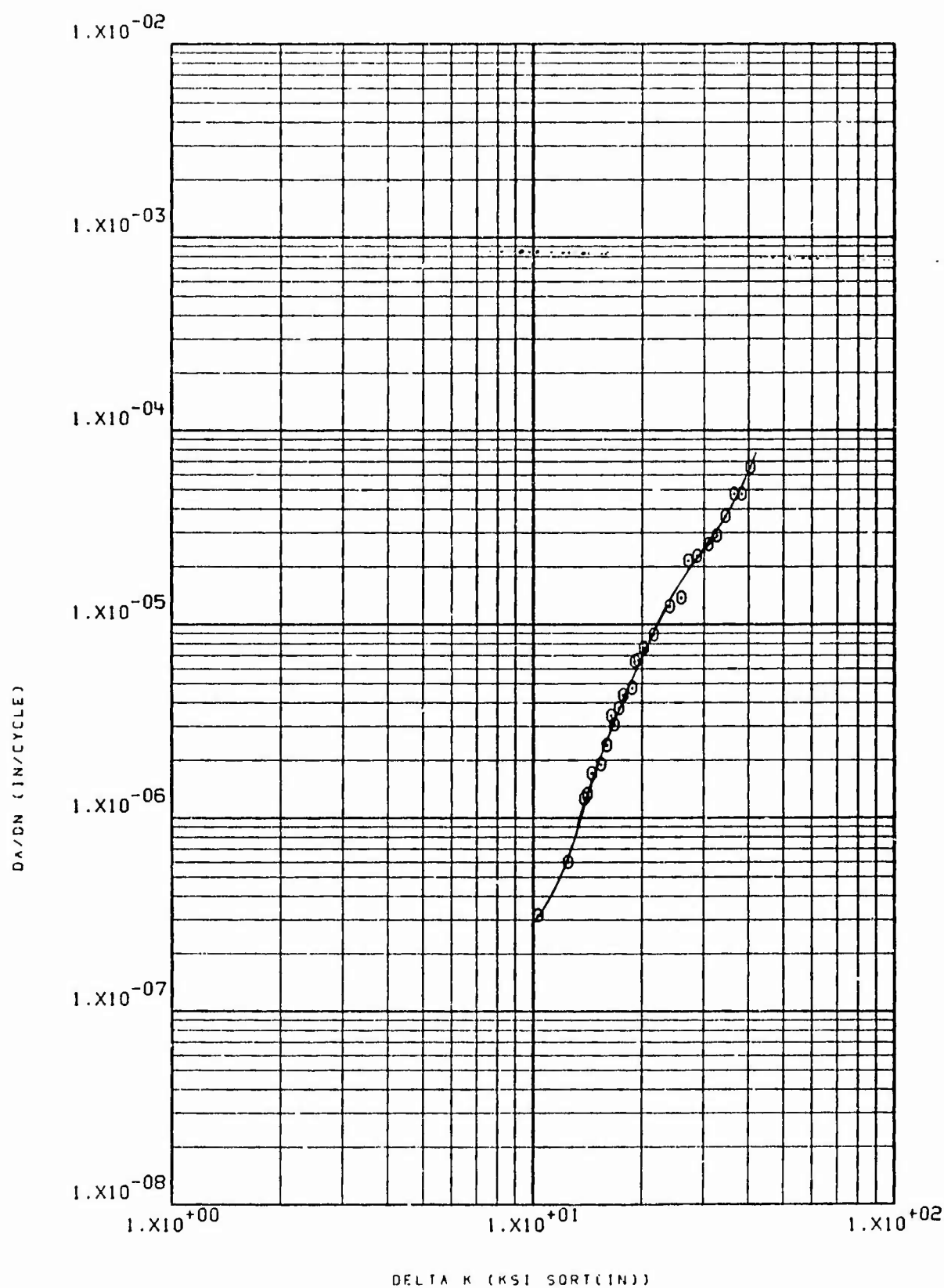
74 NWP 54-3 TI-6AL-4V DB + 4DBTC

RT SUMP 60CPM R=.08

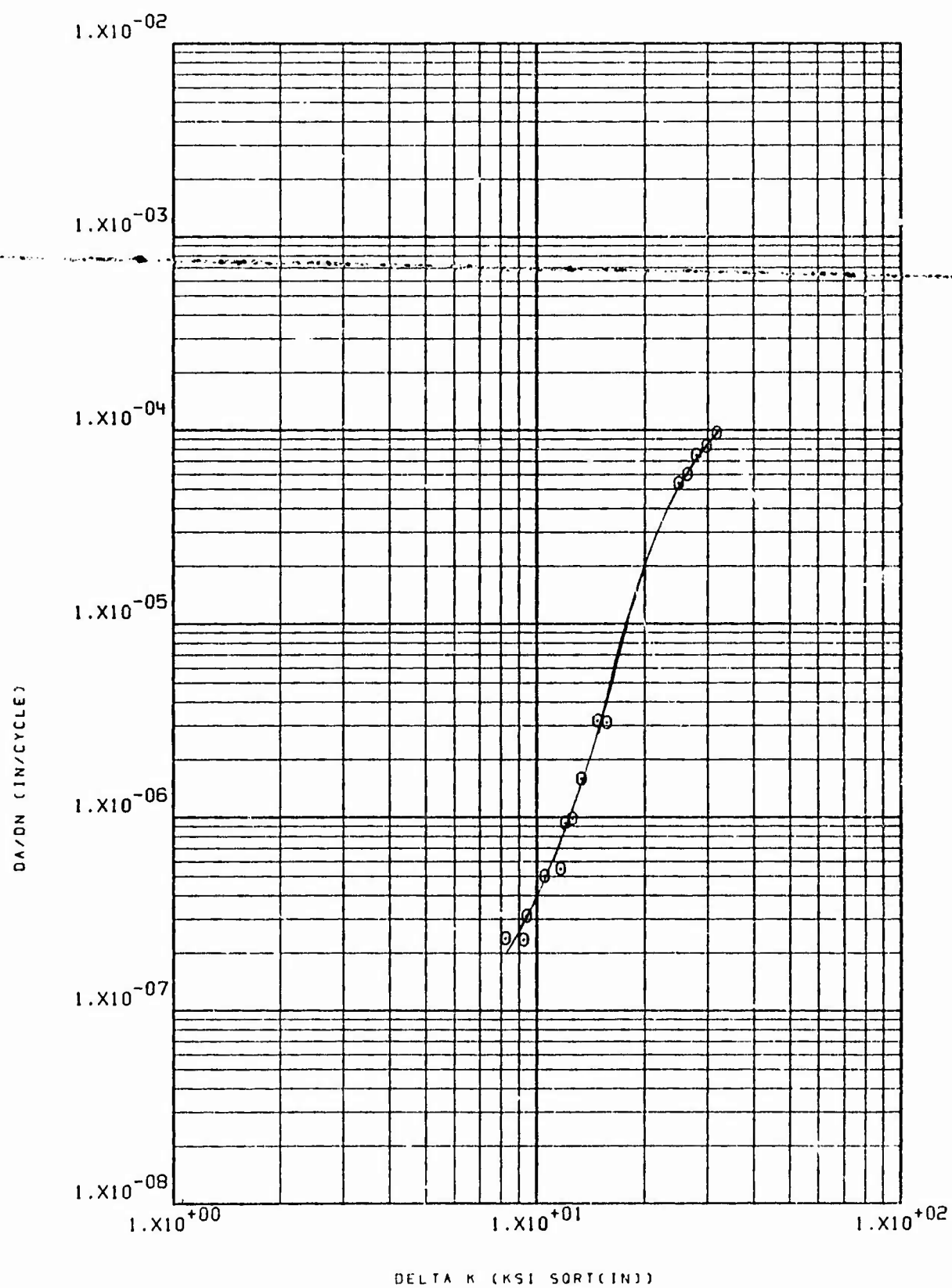


75 NP# 59-1 TI-6AL-4V

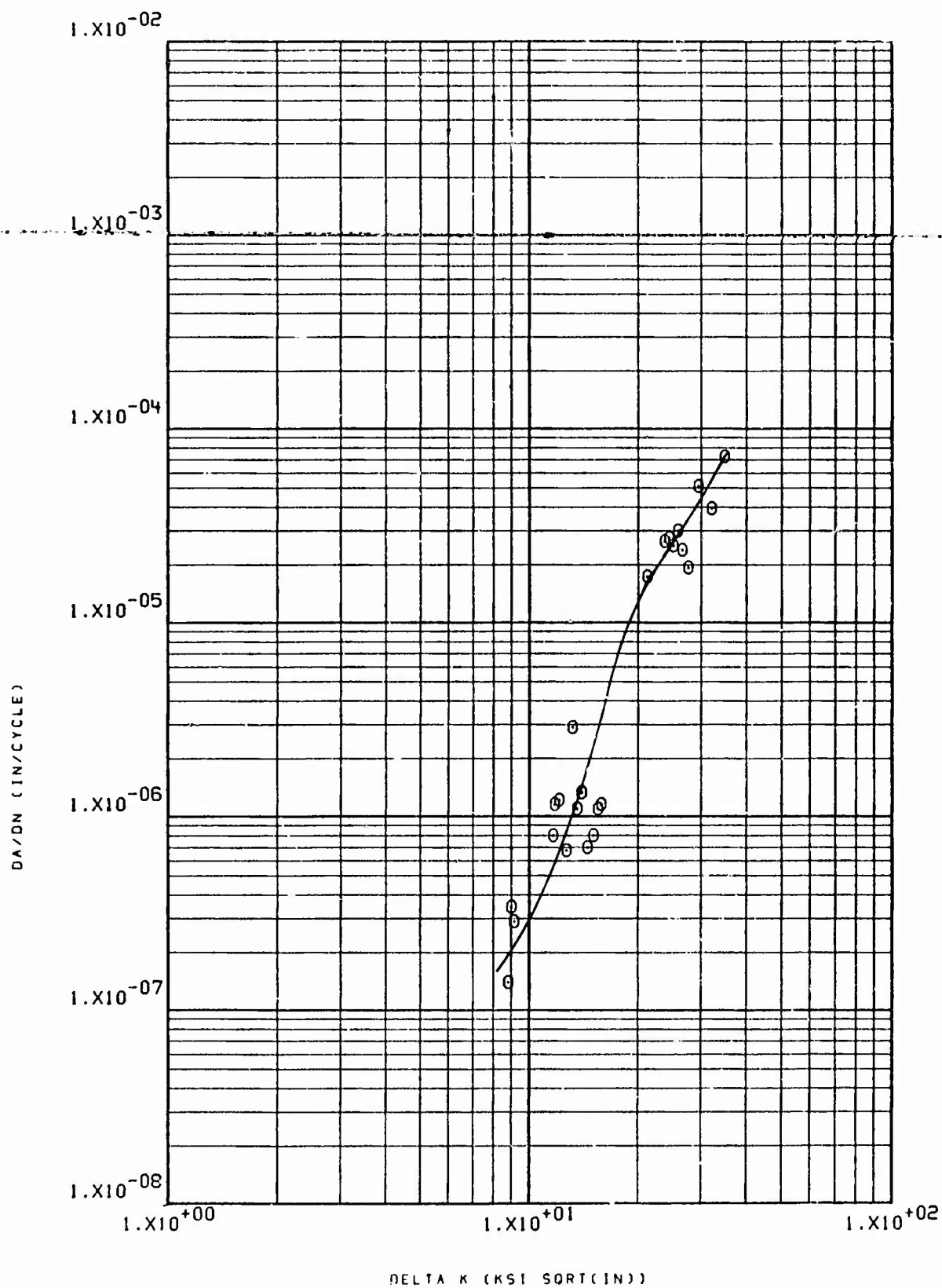
MA LHA R=0.08 RT 360CPM



75 NPY 61-16 T: GAL 47 RA LHA RT 1600PM R=08



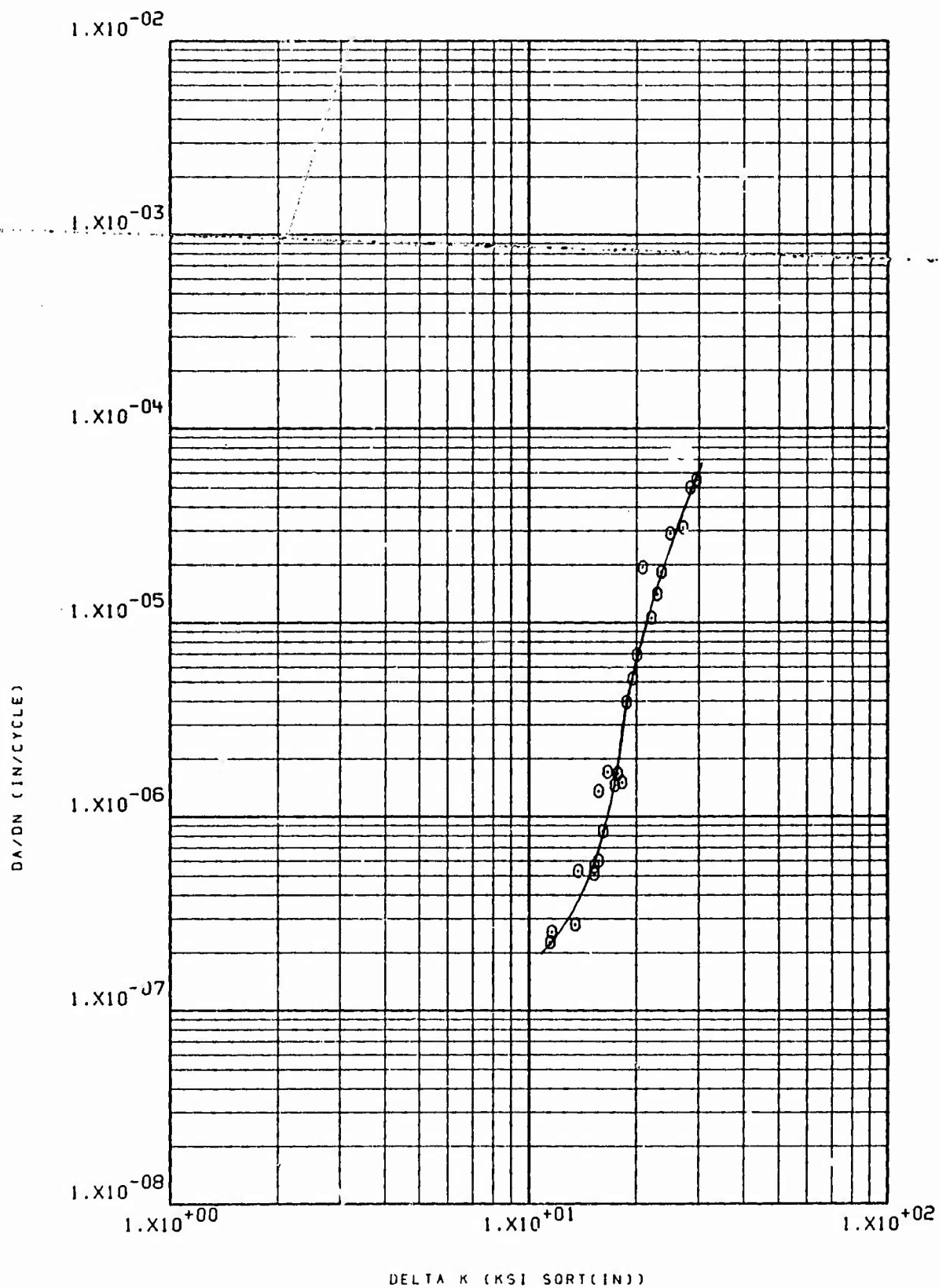
76 HPW 61-151 TI 6AL-4V RA STW RT R=.08 60CPM



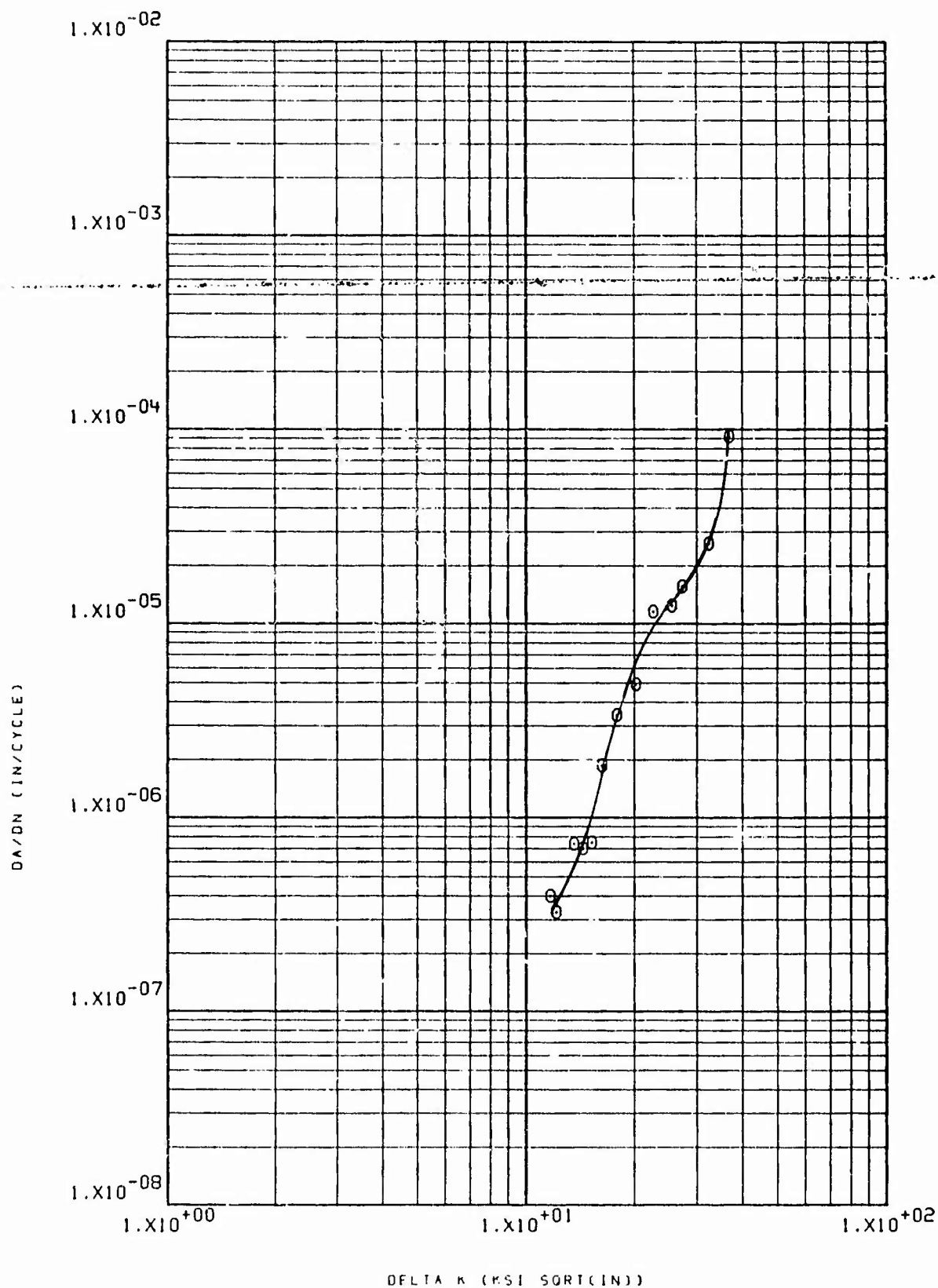
77 NDCW LA1-B TI 6AL-4V

DBTC

STW RT R=0.08 60CPM

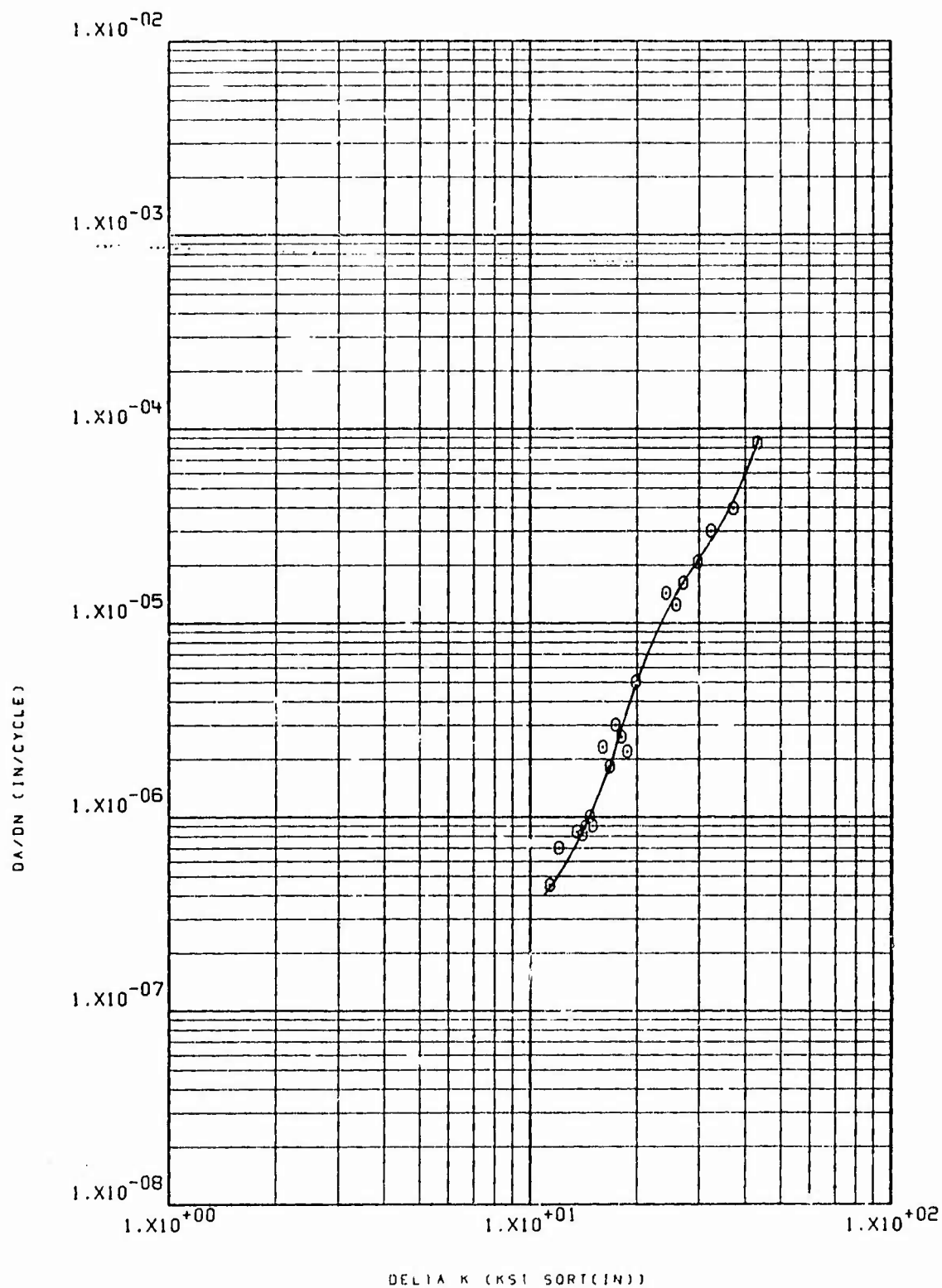


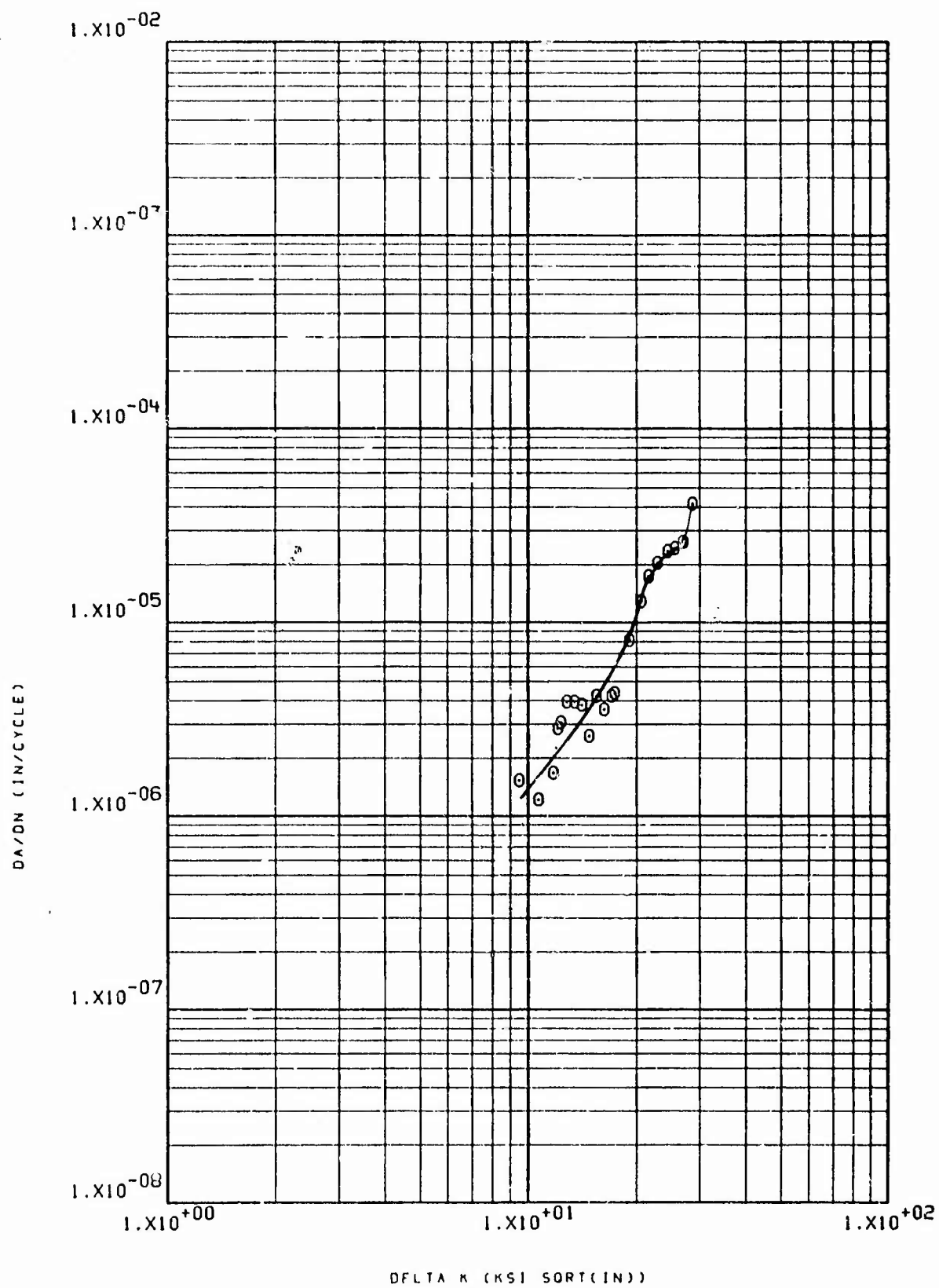
77 NWP 1012-B 11-6AL-4V STW RT R=.08 60CPM DBT + PC



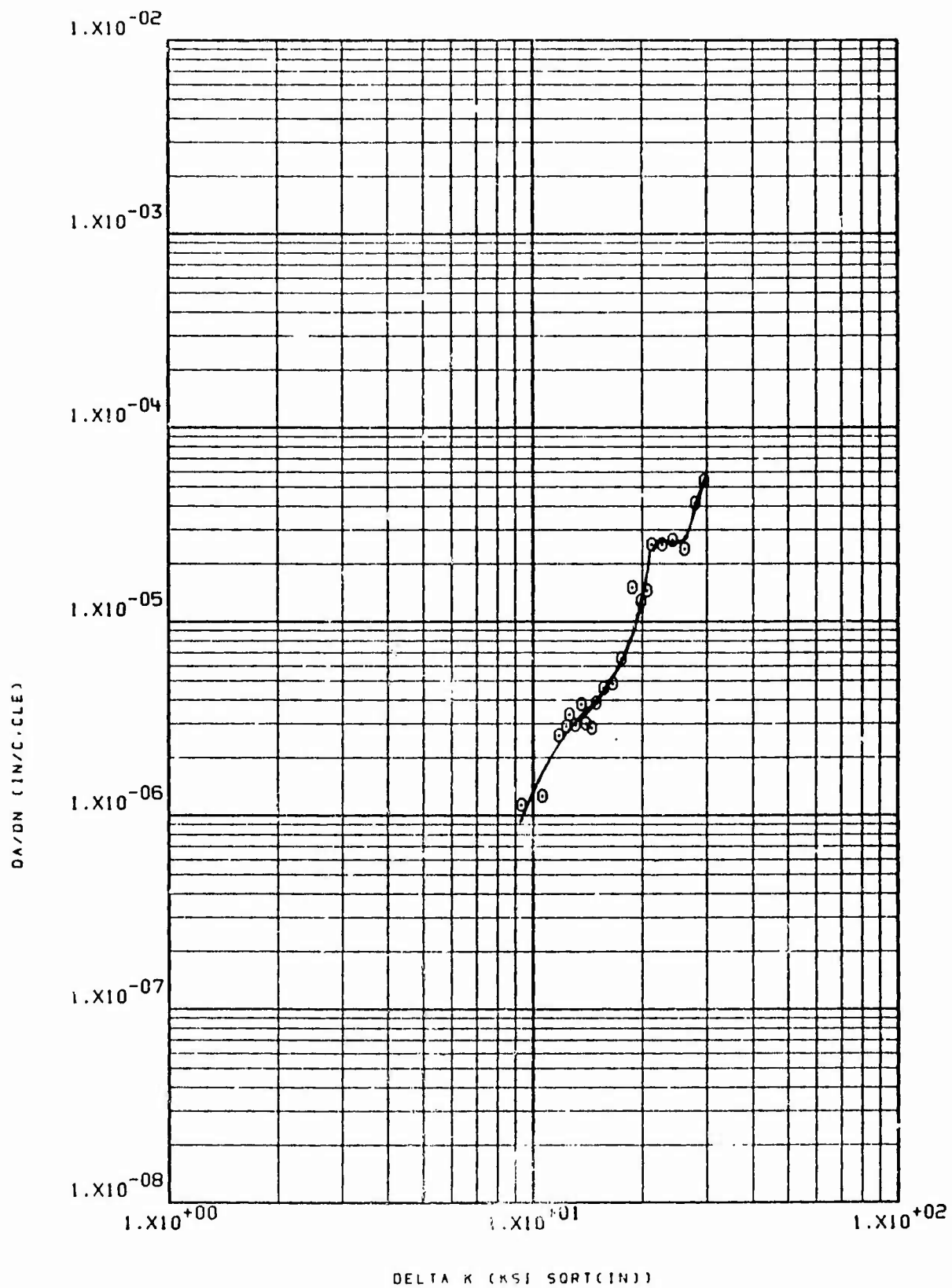
77 NWP YD 1 15A 11-6AL-4V DBTC + TR

SUMP RT R=0.08 60CPM

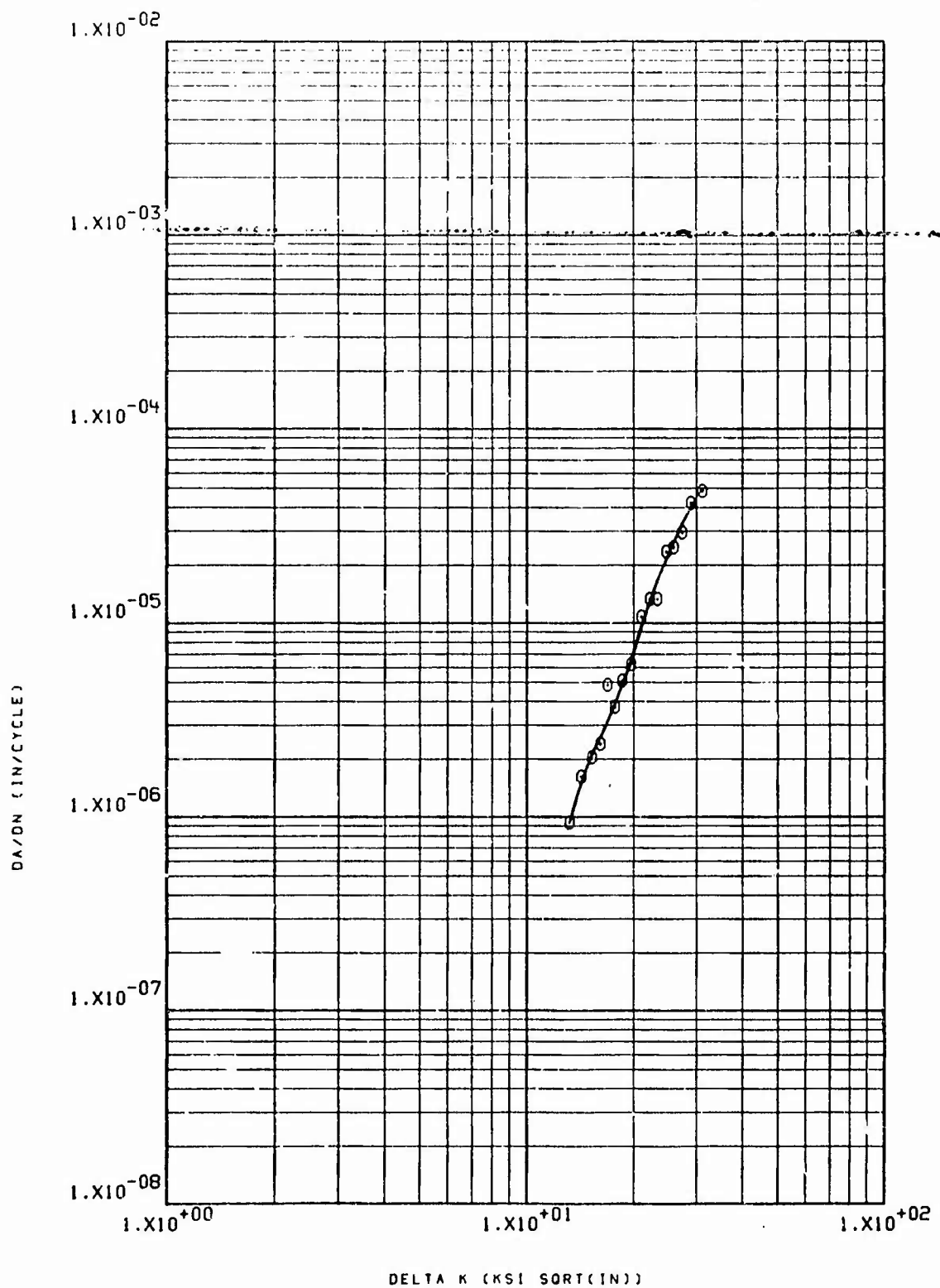




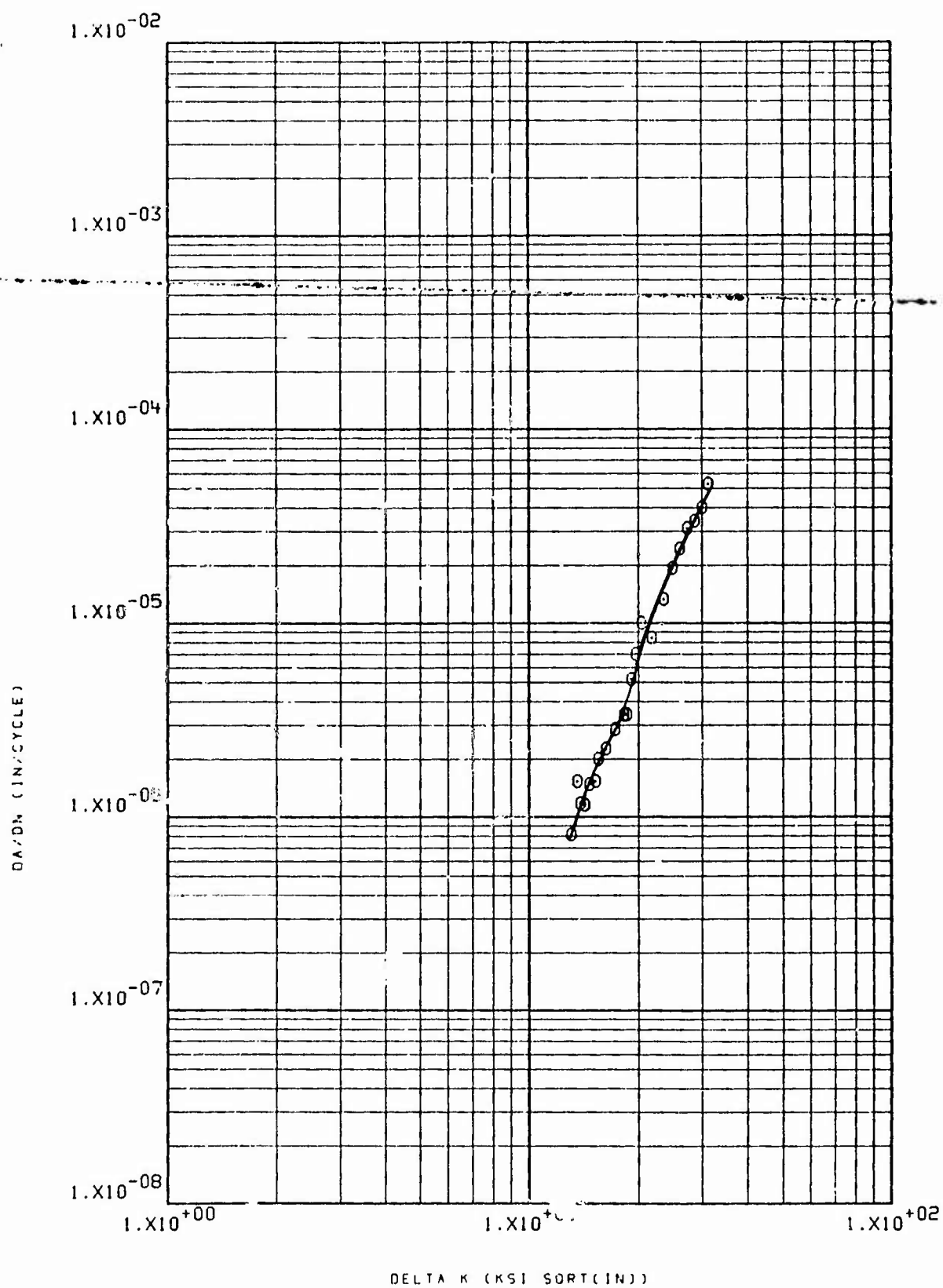
17NRW LA-1 DB TI-6AL-4V SUMP PT60CPM R=.08 0



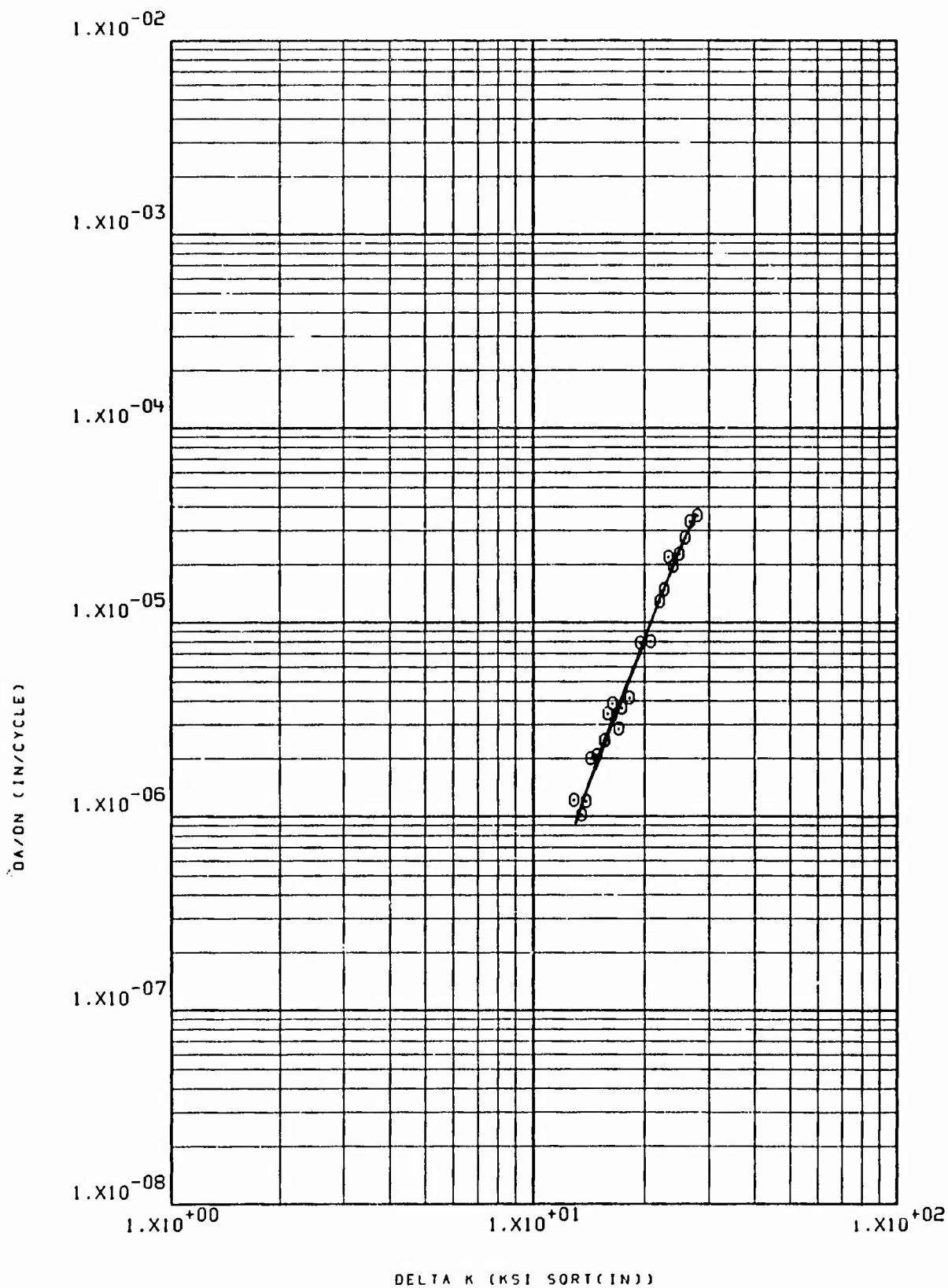
77 NWP L D-12 DB WP/WR GAL-4V RT STW 60CPH R=.08



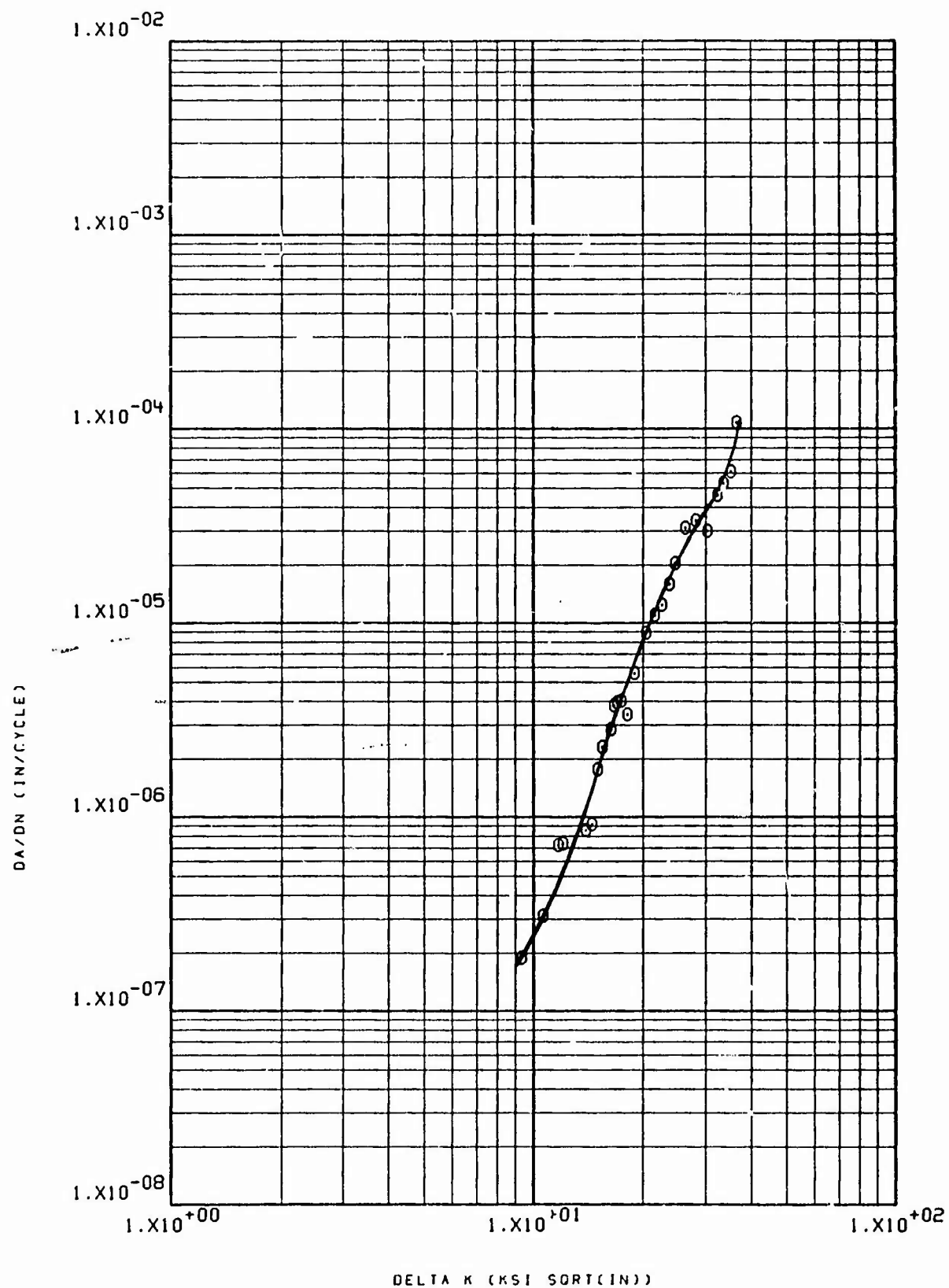
77 NRW YD-1-4 TI-6AL-4V RA STW RT R=0.08 60CPM



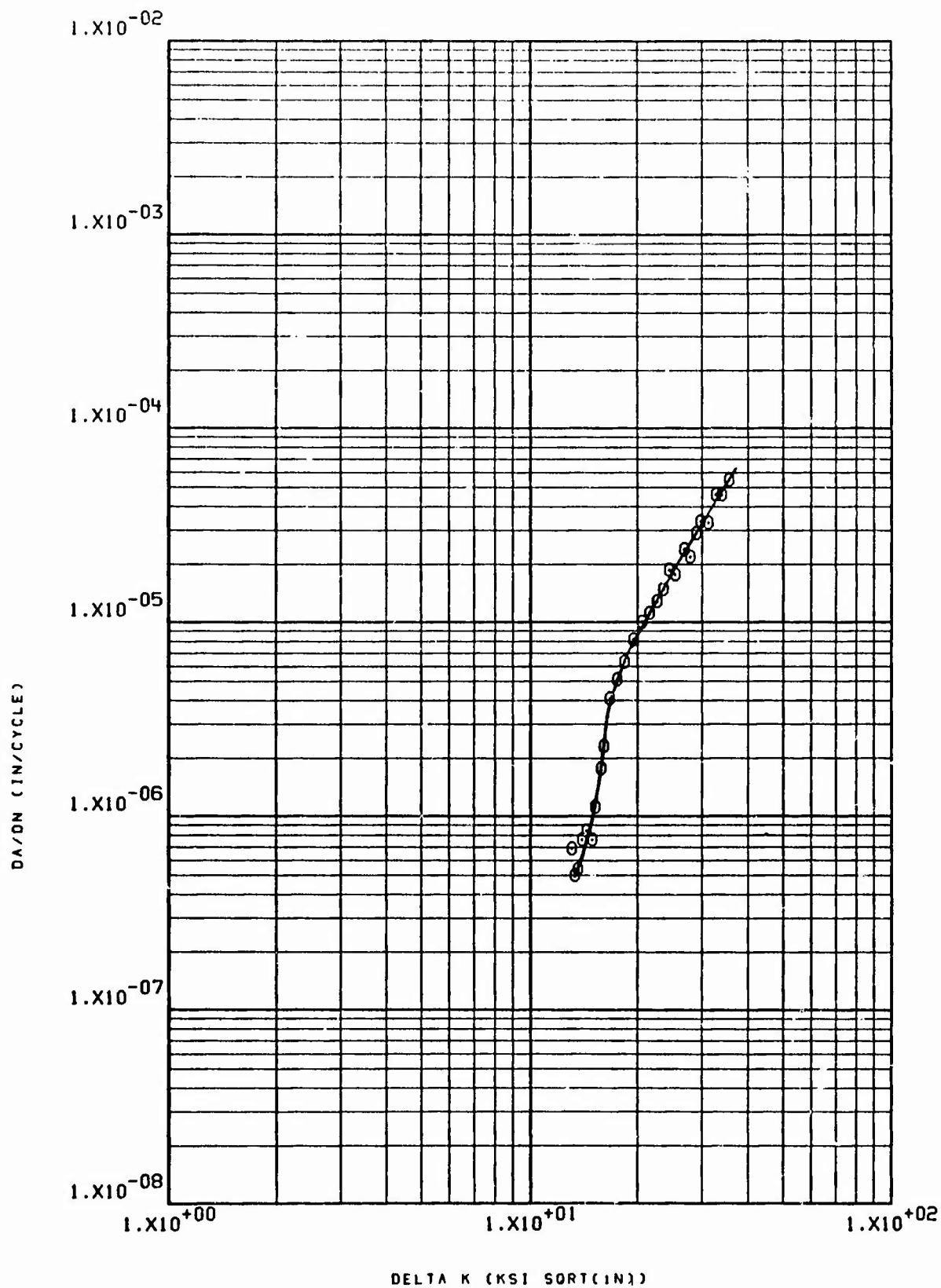
77 NWP YD 1-5 RA PLATE 11-GAL-4V SUMP RT 60CPM R=.08



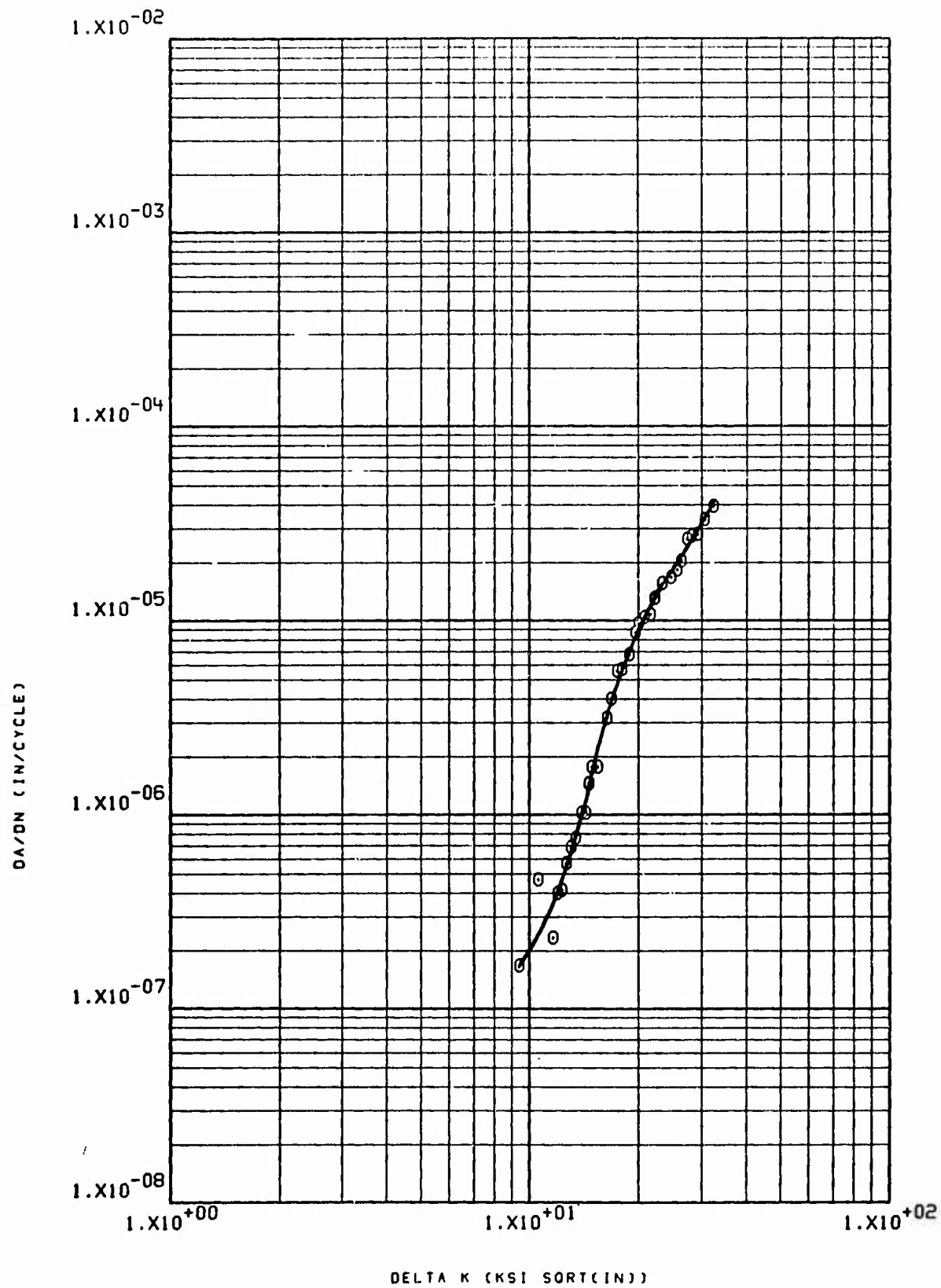
77 HPW YD 3-4 RA 11-GAL-4V SUMP RT 60CPM R+.08



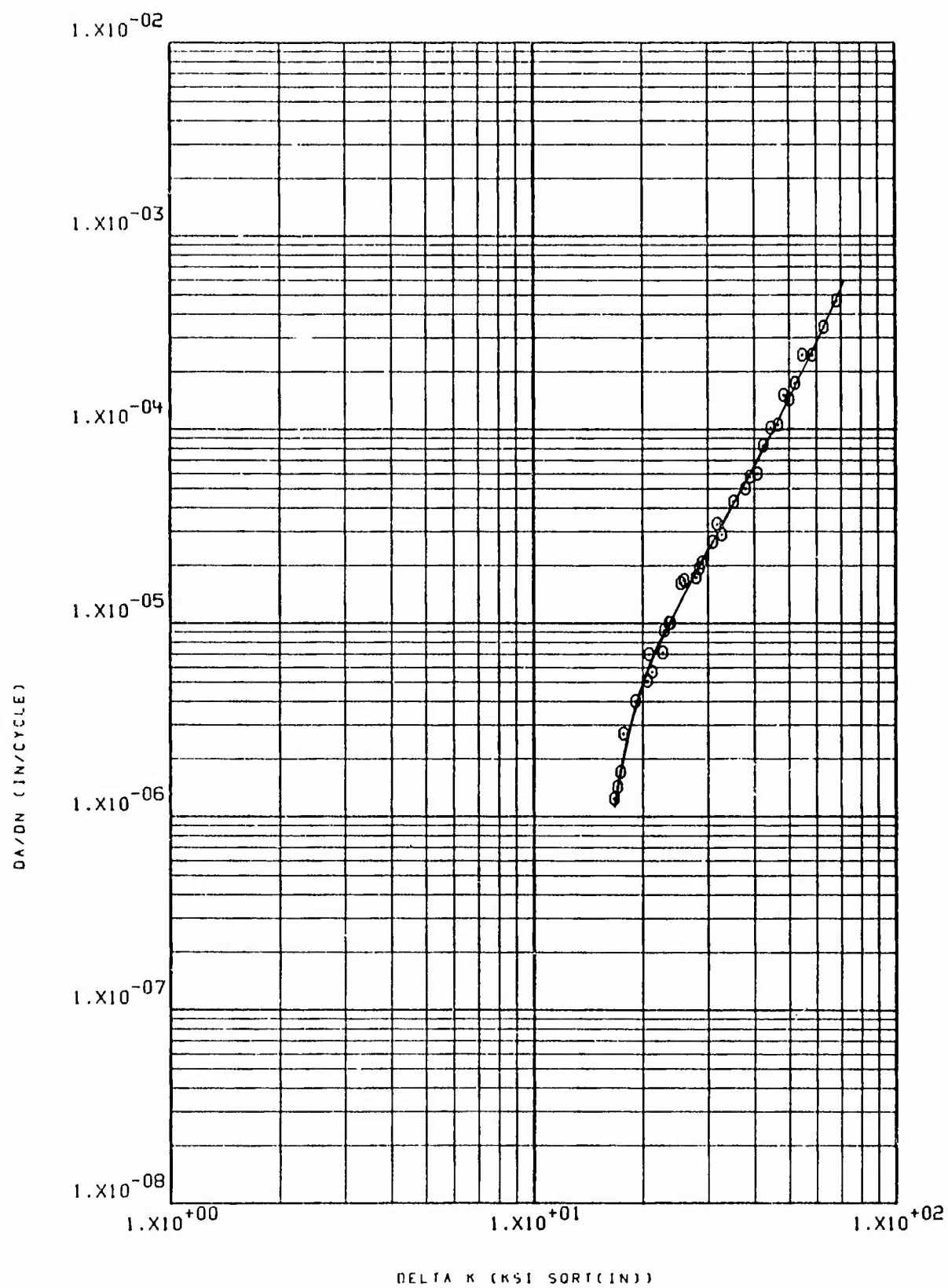
77 NWP YD 3-5 RA 11-6AL-4V SUMP PT 60CPM R=.08



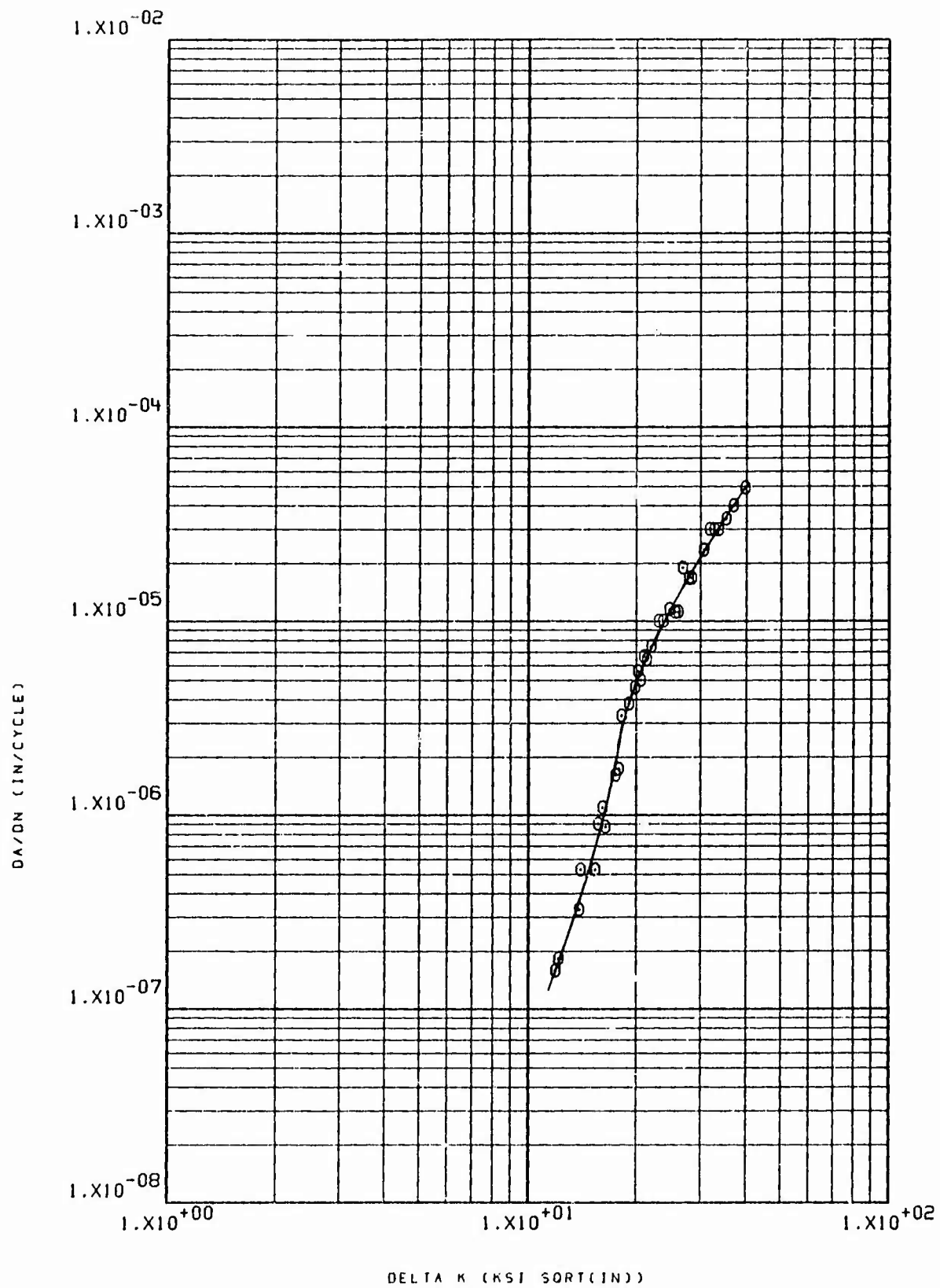
77 NRW YD 3-16 RA TI-6AL-4V LHA RT 360CPM R=.08



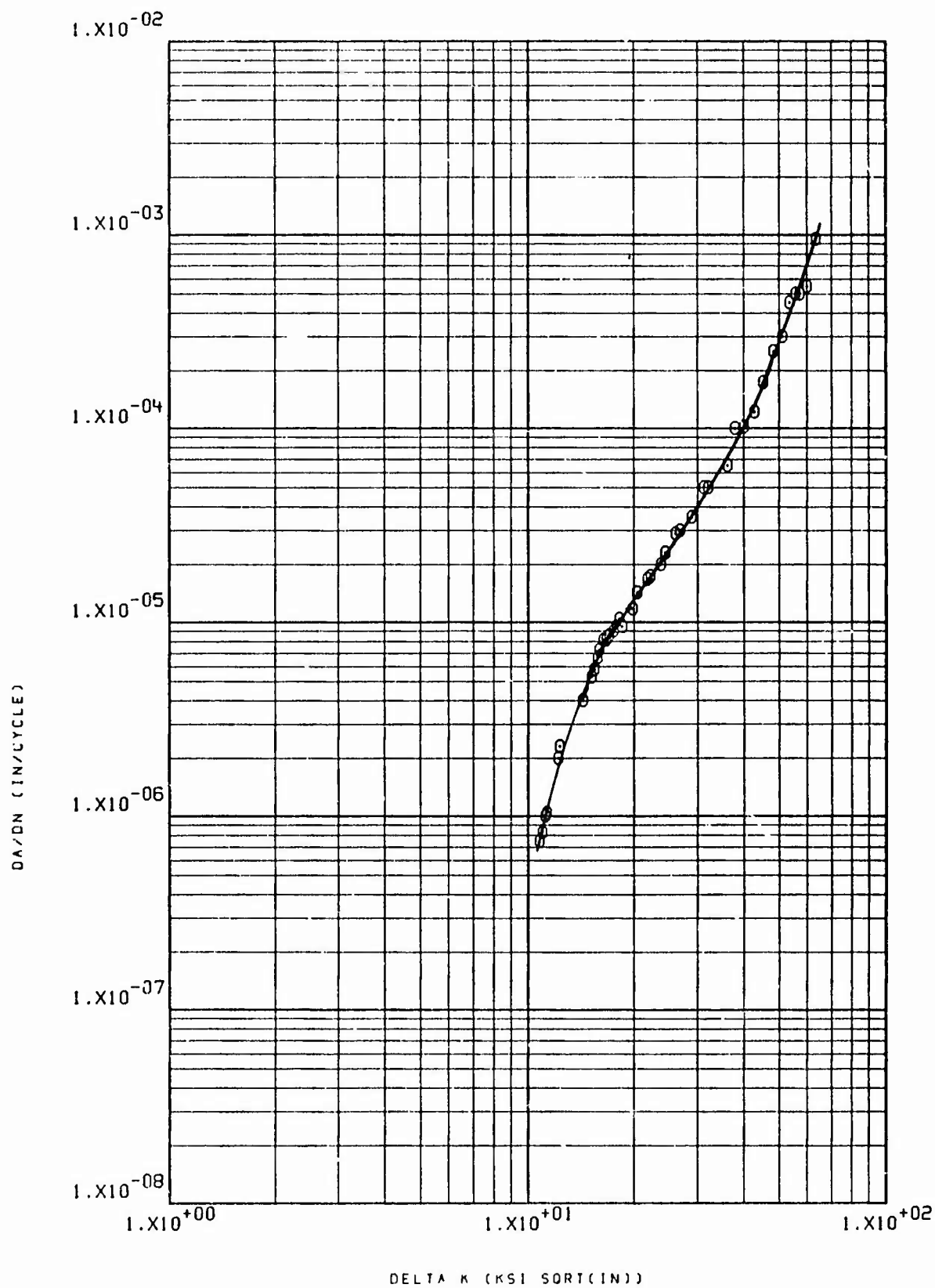
77 NWR YD 3-17 RA TI-6AL-4V LHA RT 360CPM R=.08



73 HRV 77-1 T1 6AL-4V RA HD EDGE LHA PT R=0.08 60CPH

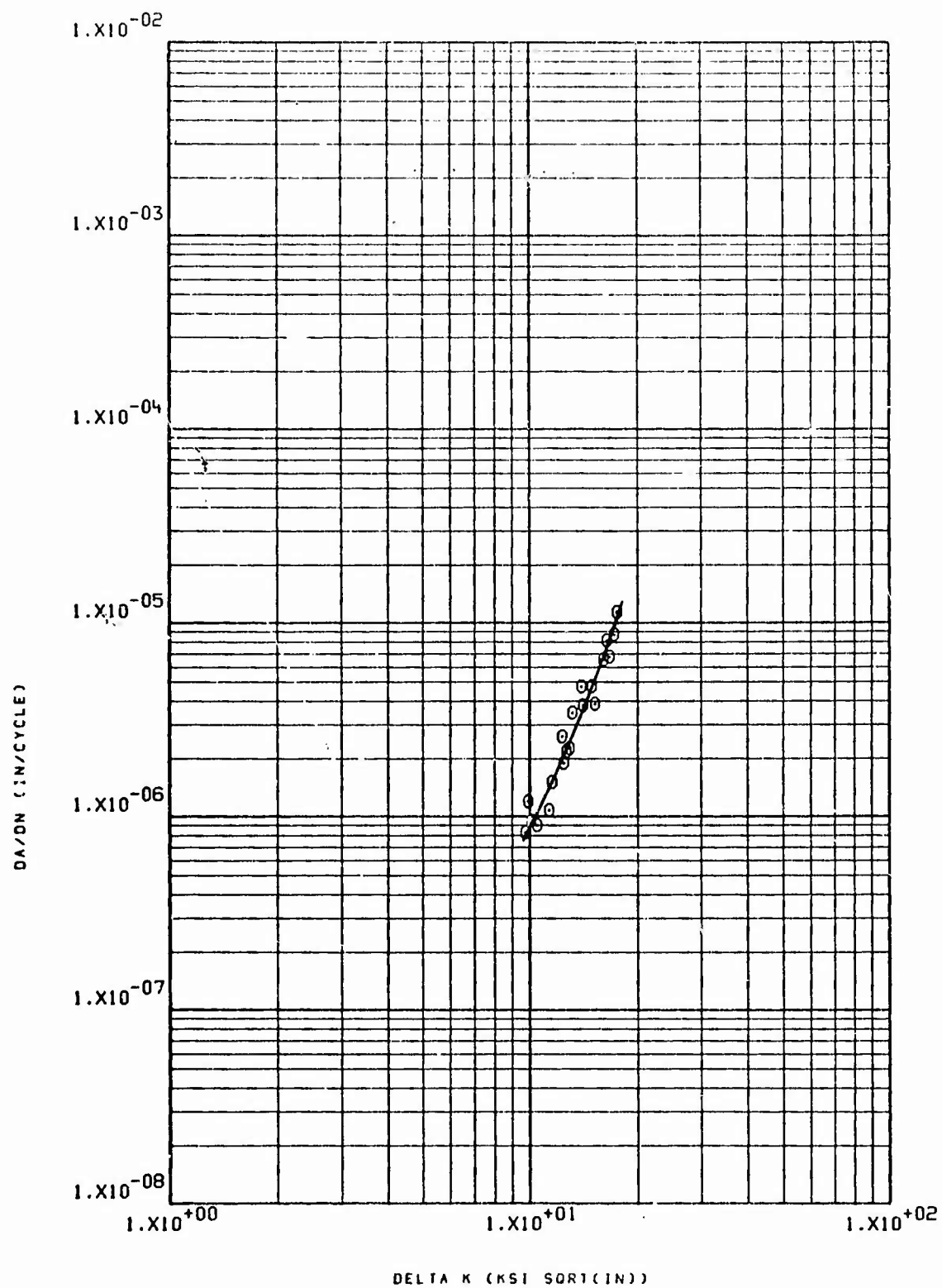


73 HPW 77-2 11 6AL-4V RA HD FRGE LHA RT R=.08 360CPH

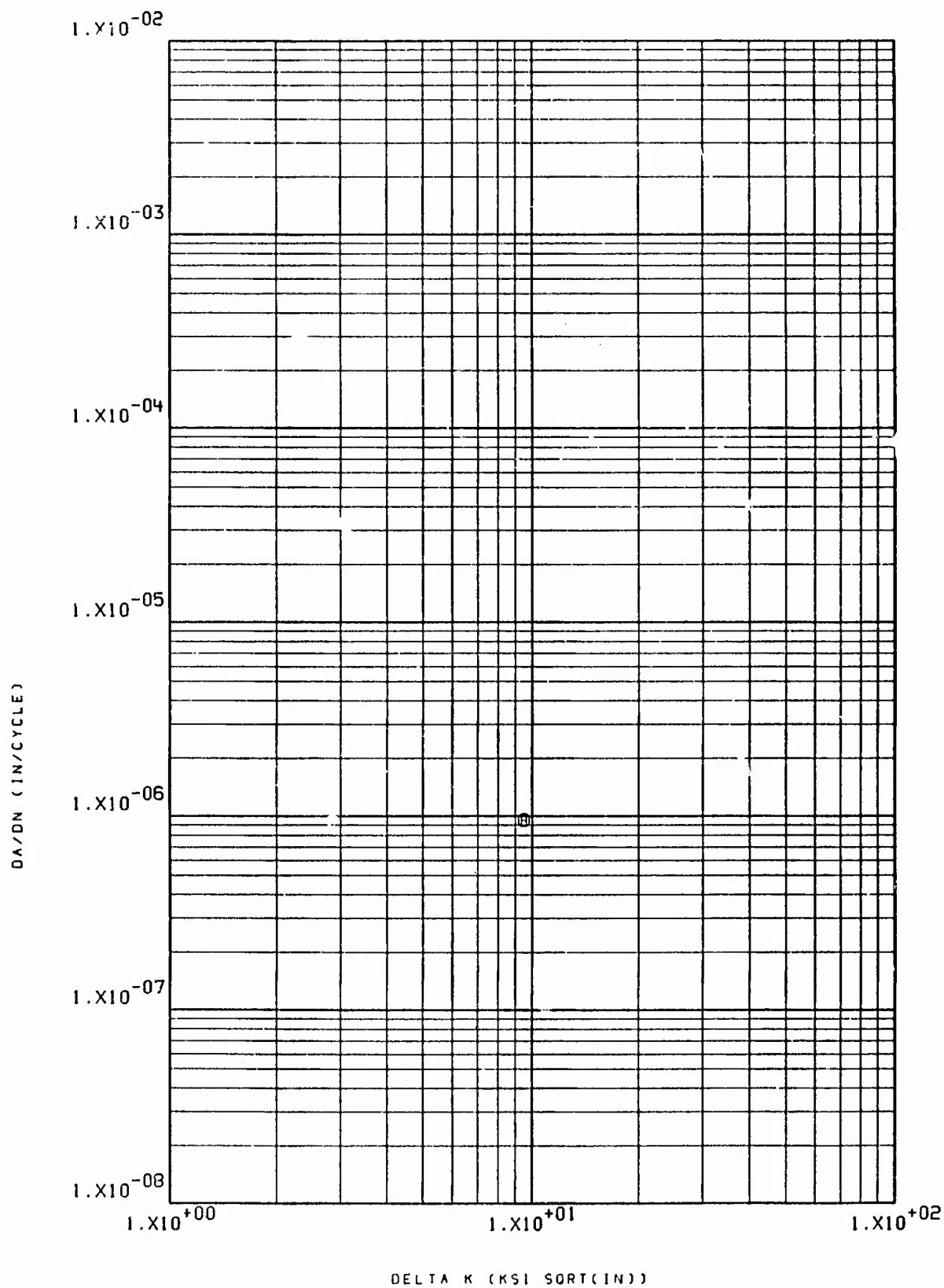


79 NPW 77-3

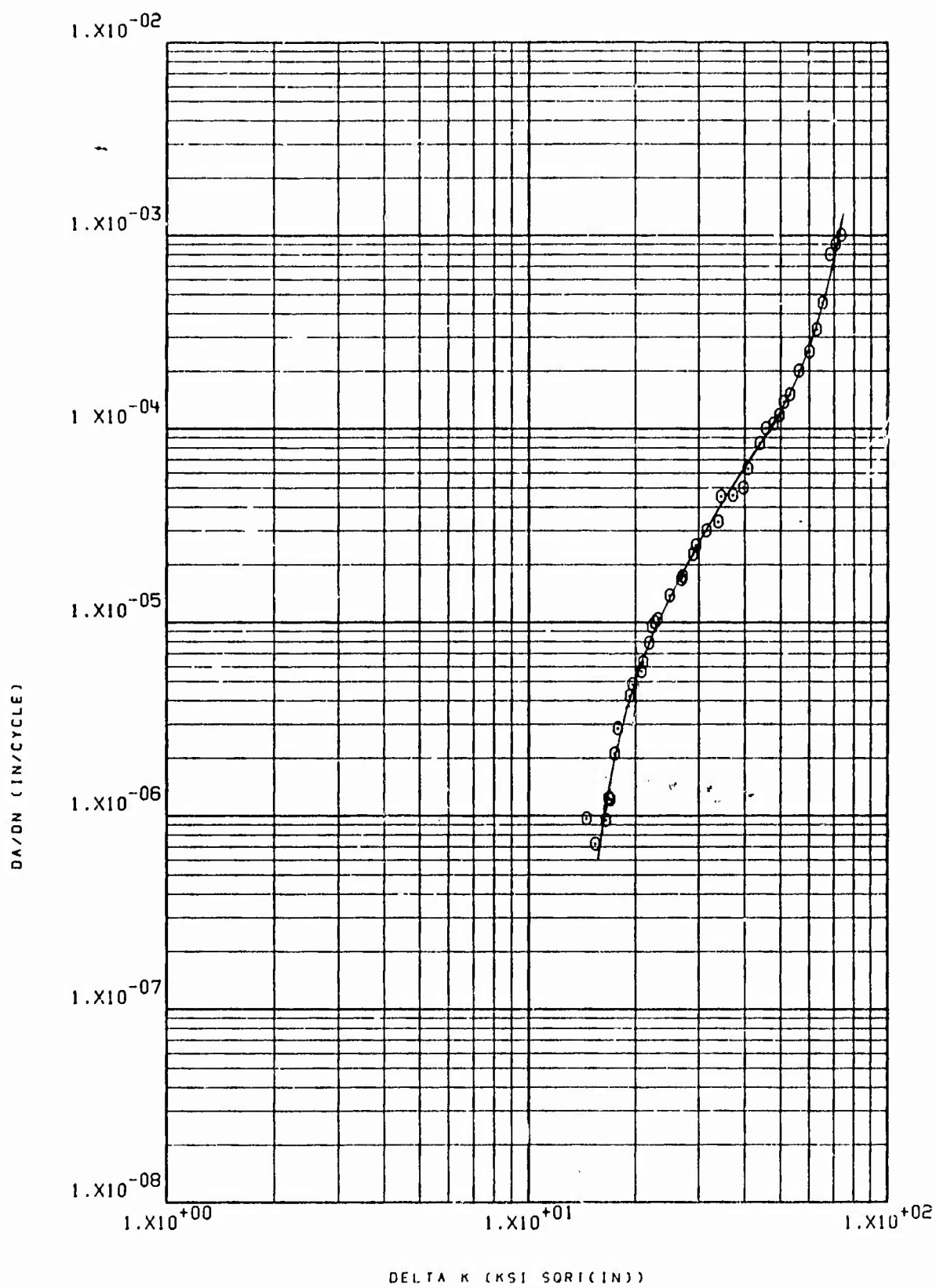
Ti-6AL-4V PA HD FDG LHA RT R=.3 360CPM



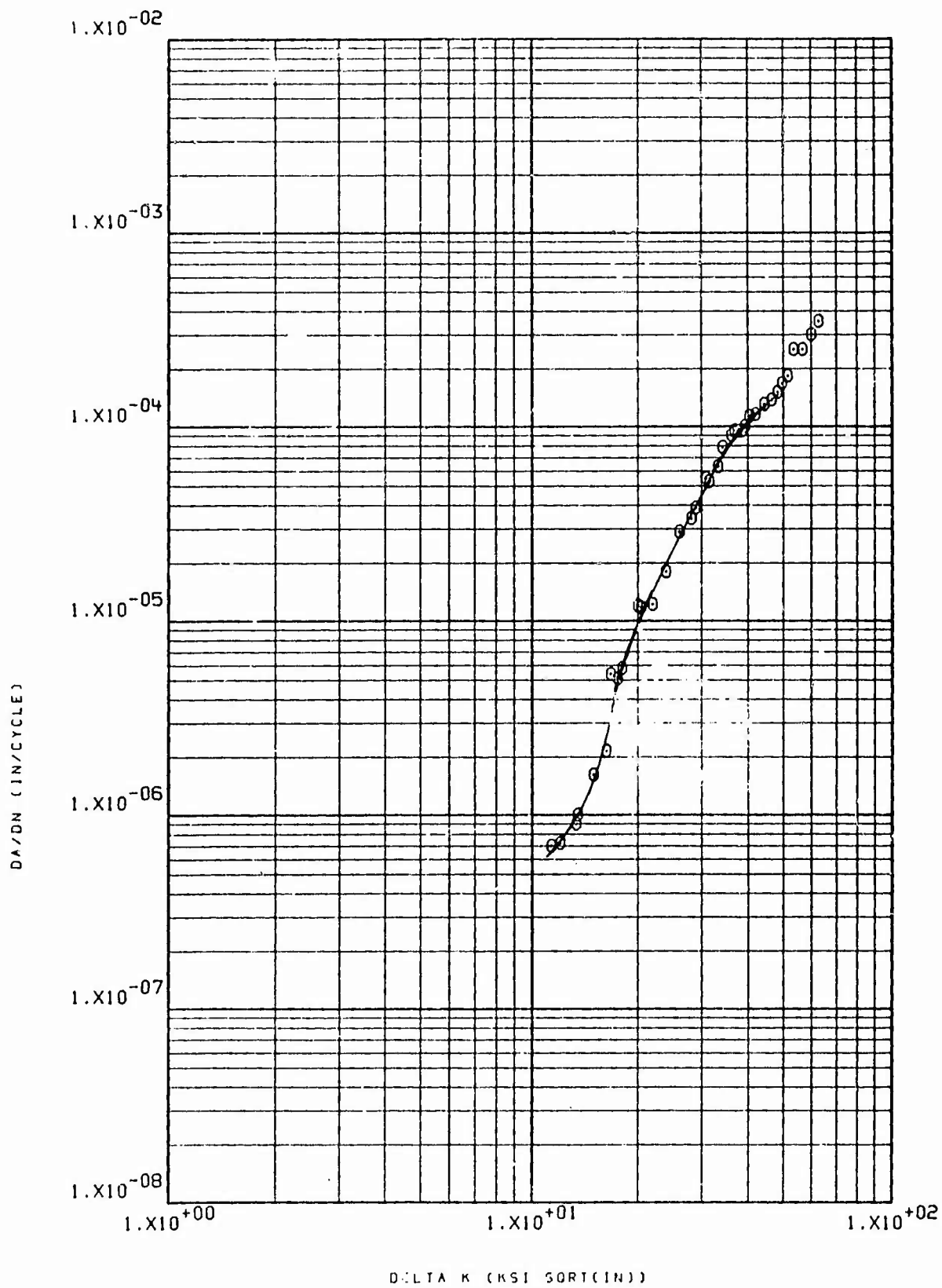
79 NRW 77-4 T1-6AL-4V RA HAND-FORGED LHA R1 R=0.5 360CPH



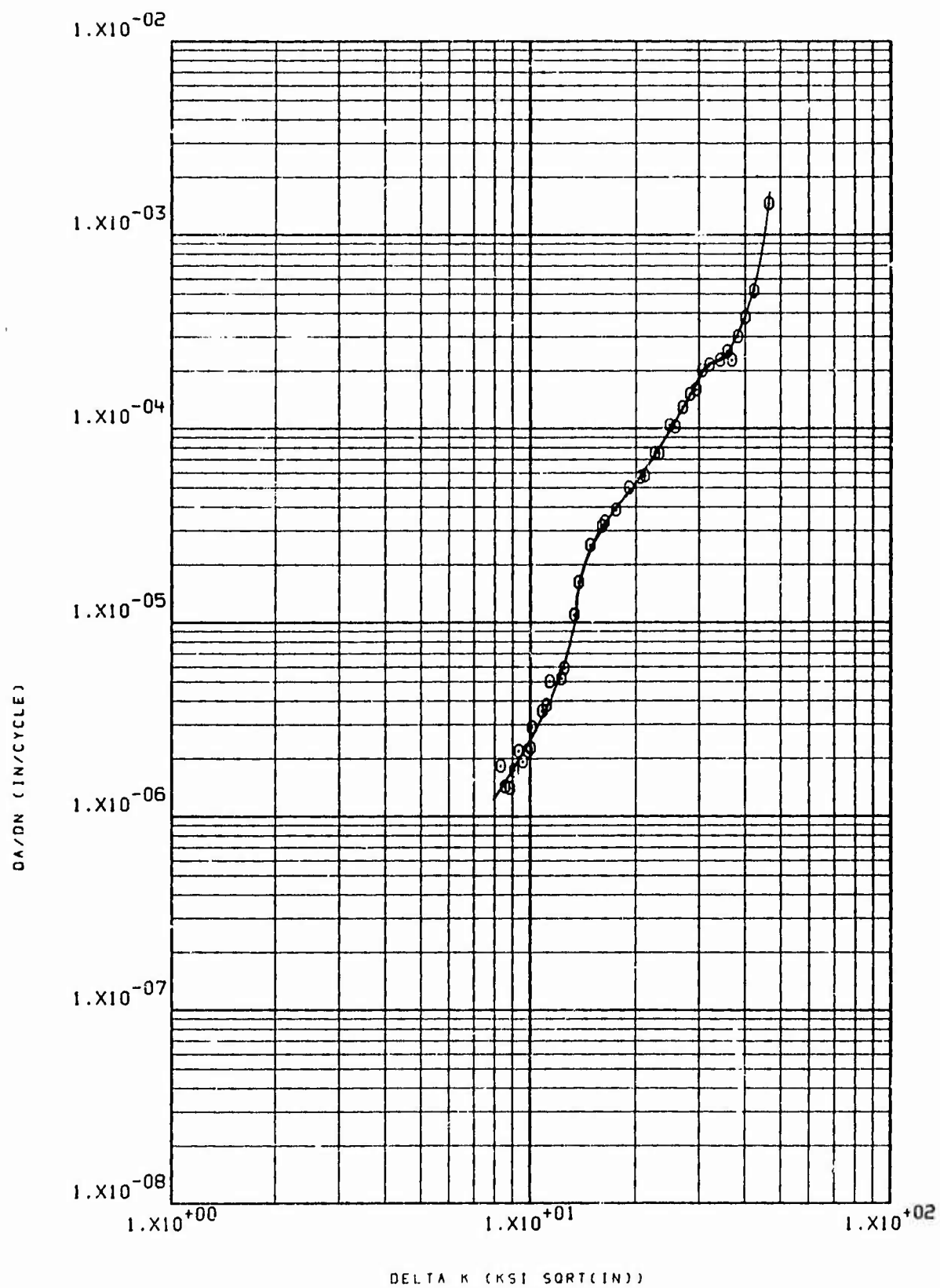
79 NRW 77.5 TI-6AL-4V PA SUMP RT R=0.5 60CPM



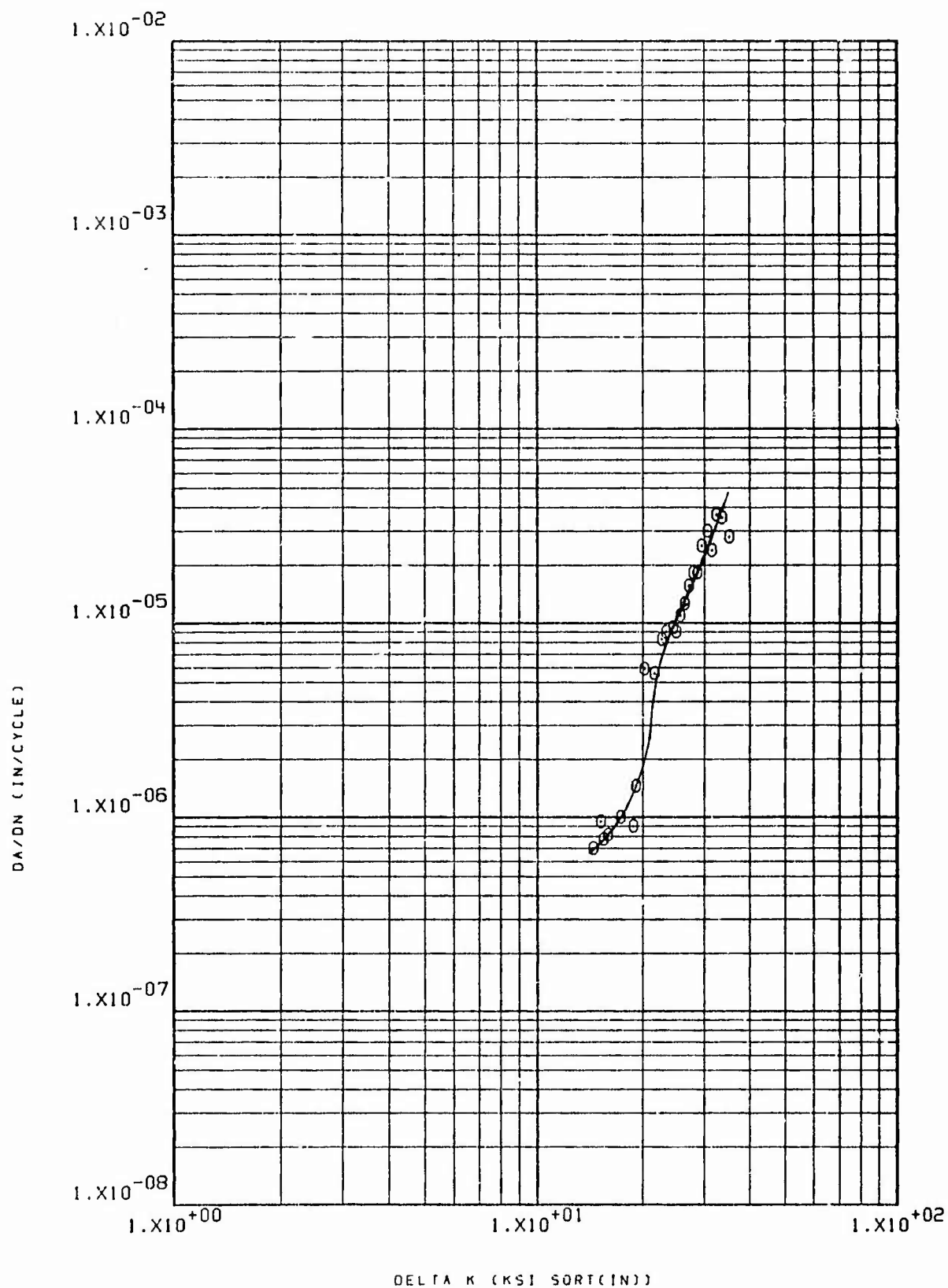
79 NWR 77-20 T1 6AL-4V RA LHA RT P .08 360CPH



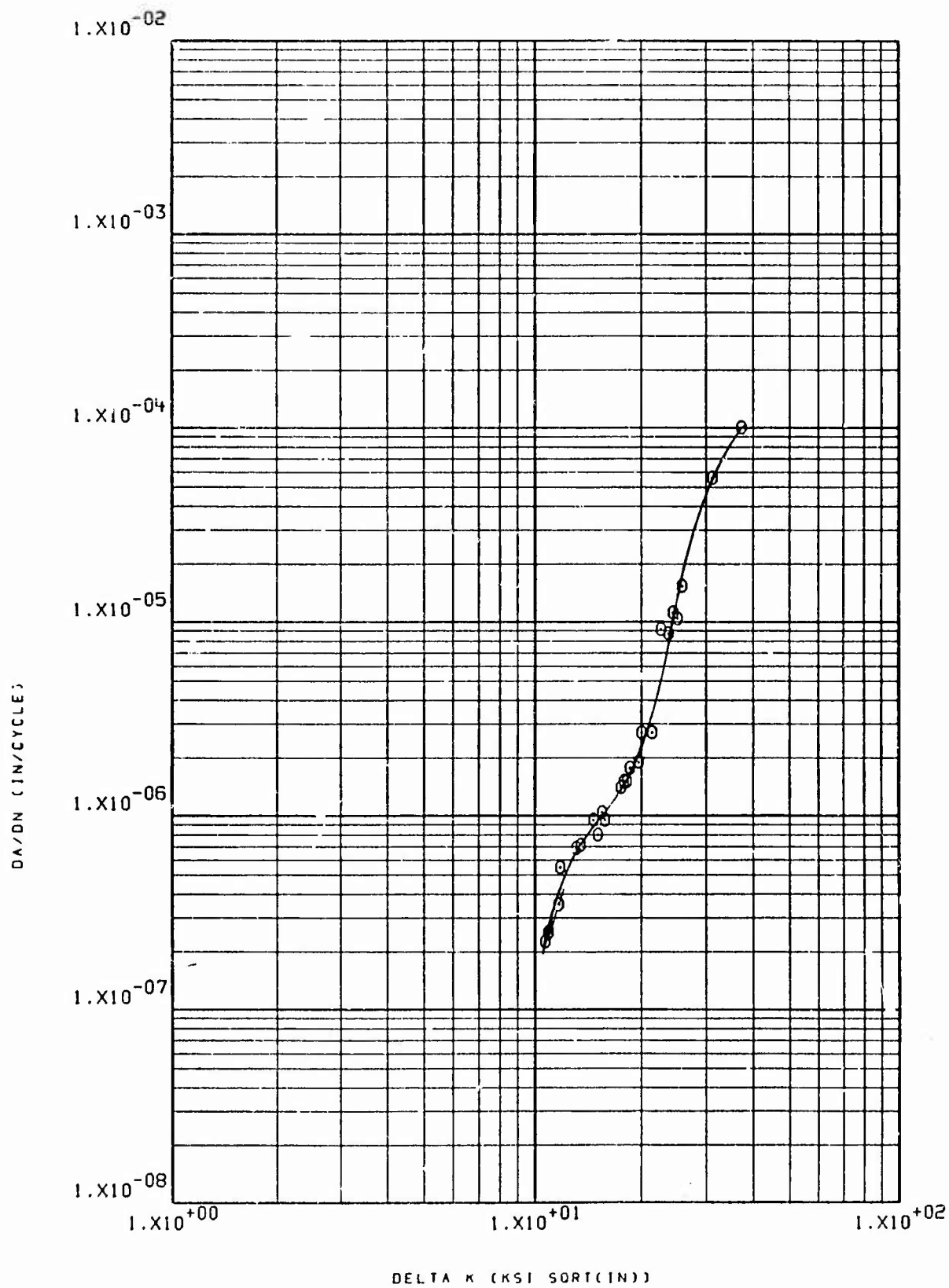
79 HWR 77-21 II 6AL-4V HAND FORGED RA SUMP RT R=.08 60CPM



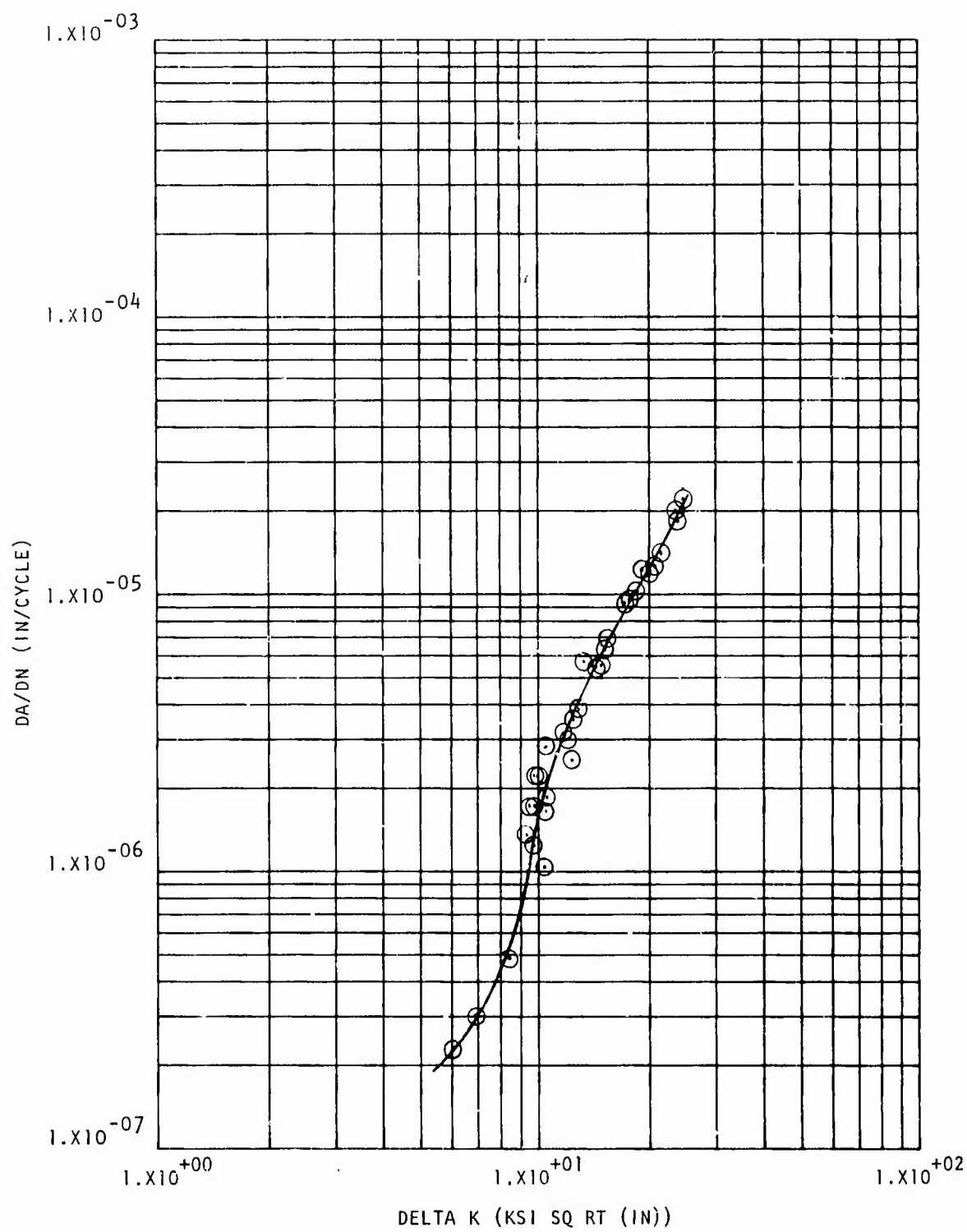
79-NWR 77-22 T1 6AL-4V RA SUMP RT P=0.5 60 CPM



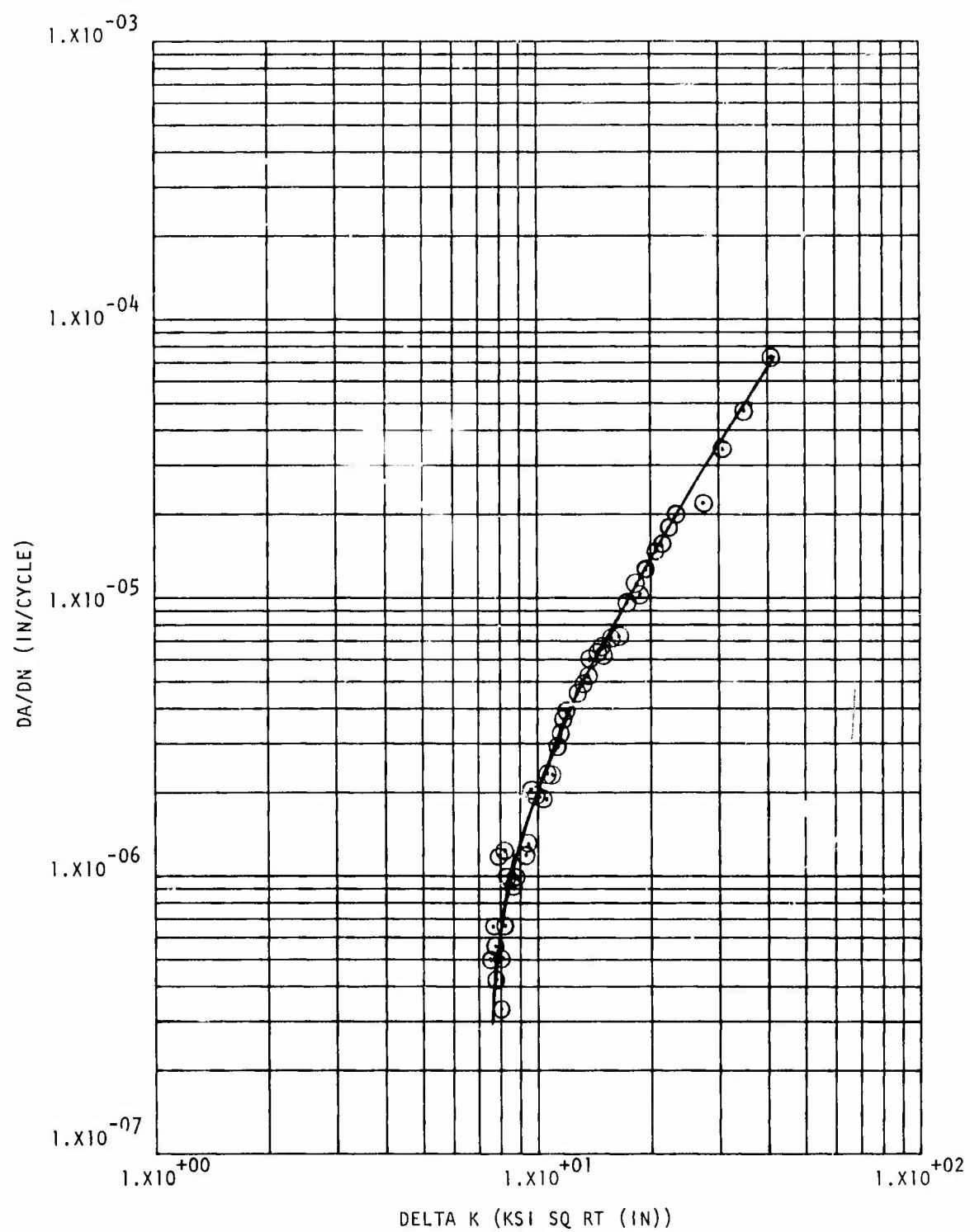
73 HPW 77-23 TJ 6AL-4V RA FUEL RT P=,08 60CPM



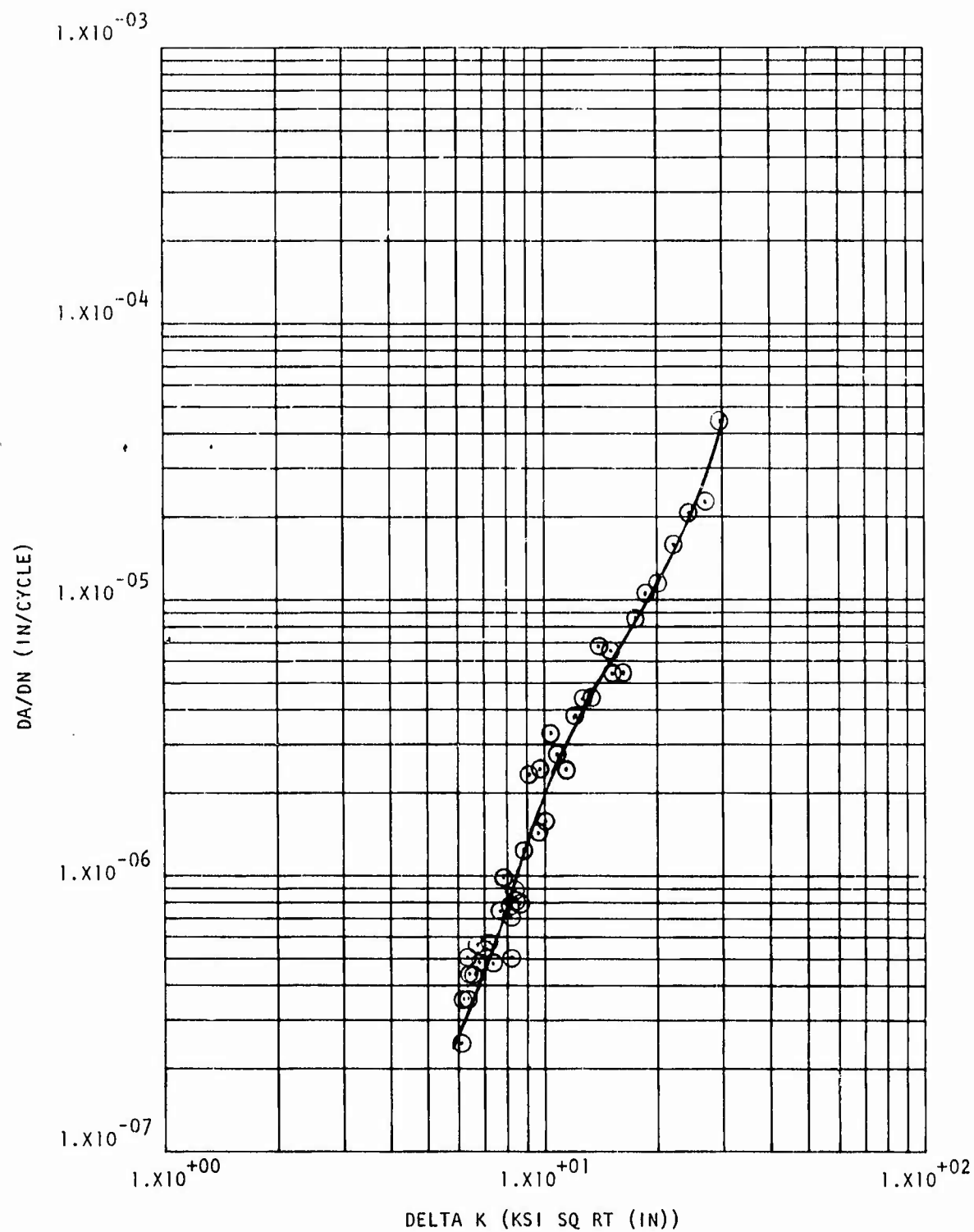
79 NPW 77-24 TIGAL-4V RA SUMP RT P=.08 60CPH



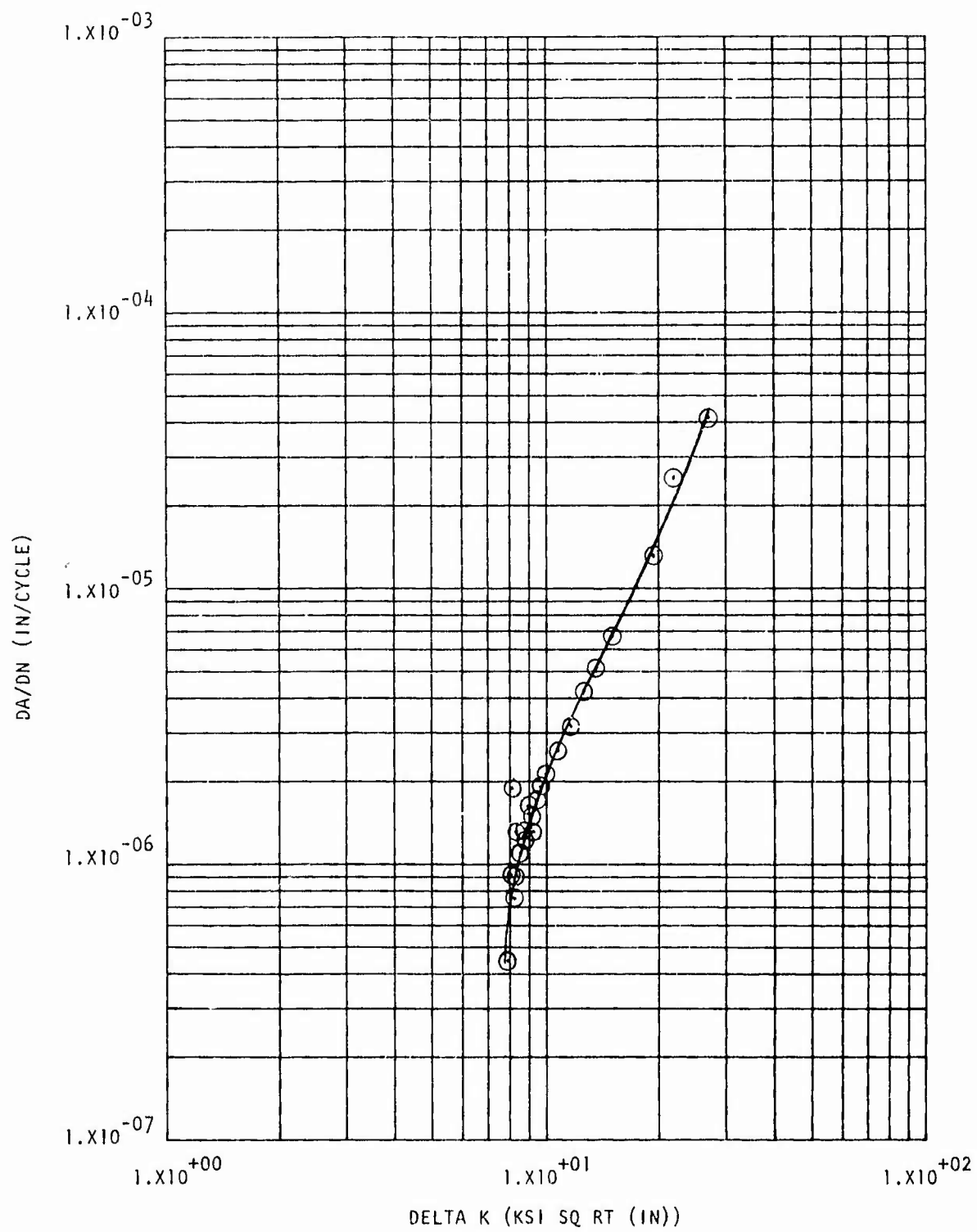
80 NRW 84-5 Ti-6Al-4V MA LHA RT R = 0.08 60 CPM



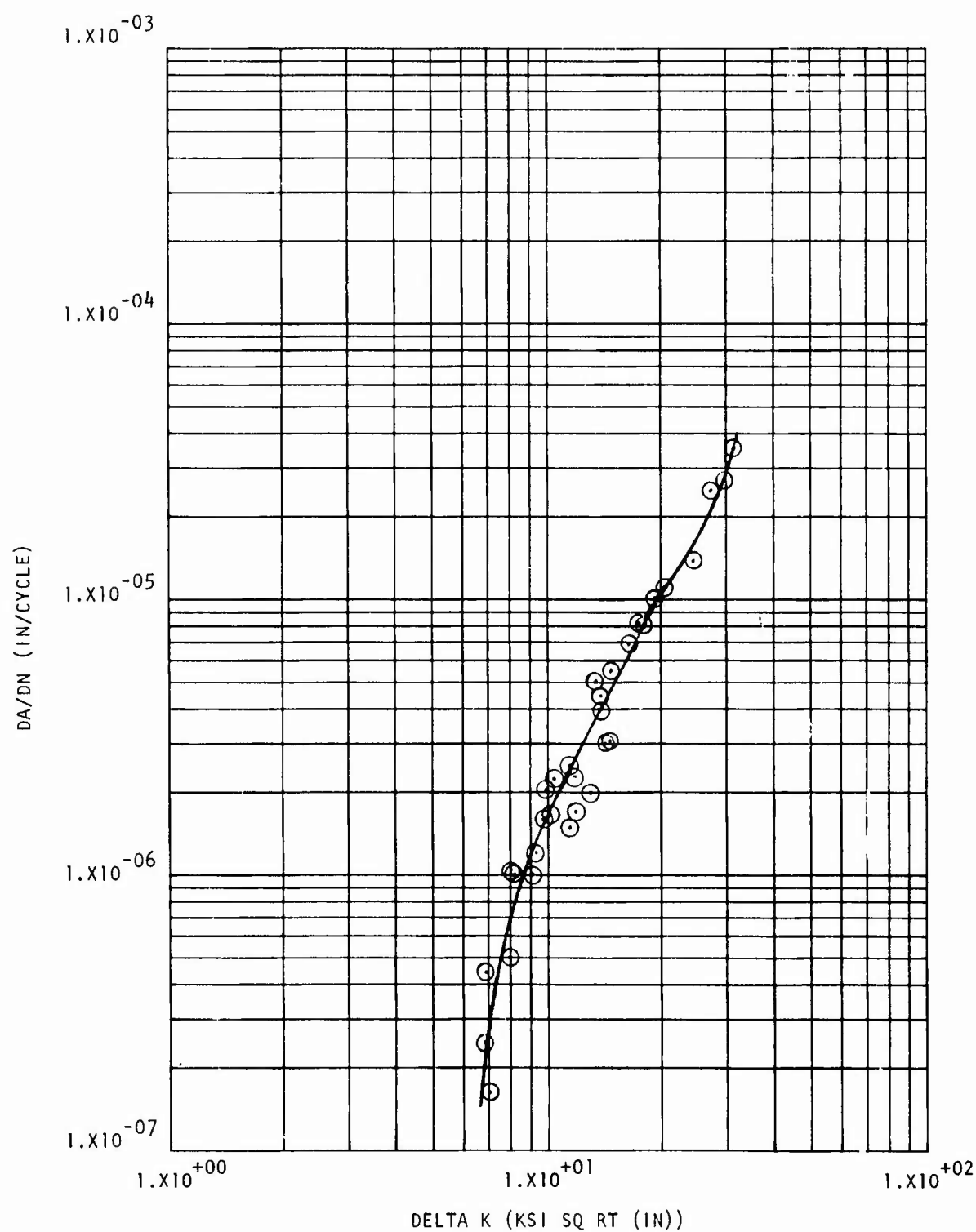
80 NRW 84-6 Ti-6Al-4V MA LHA RT R = .08 360 CPM



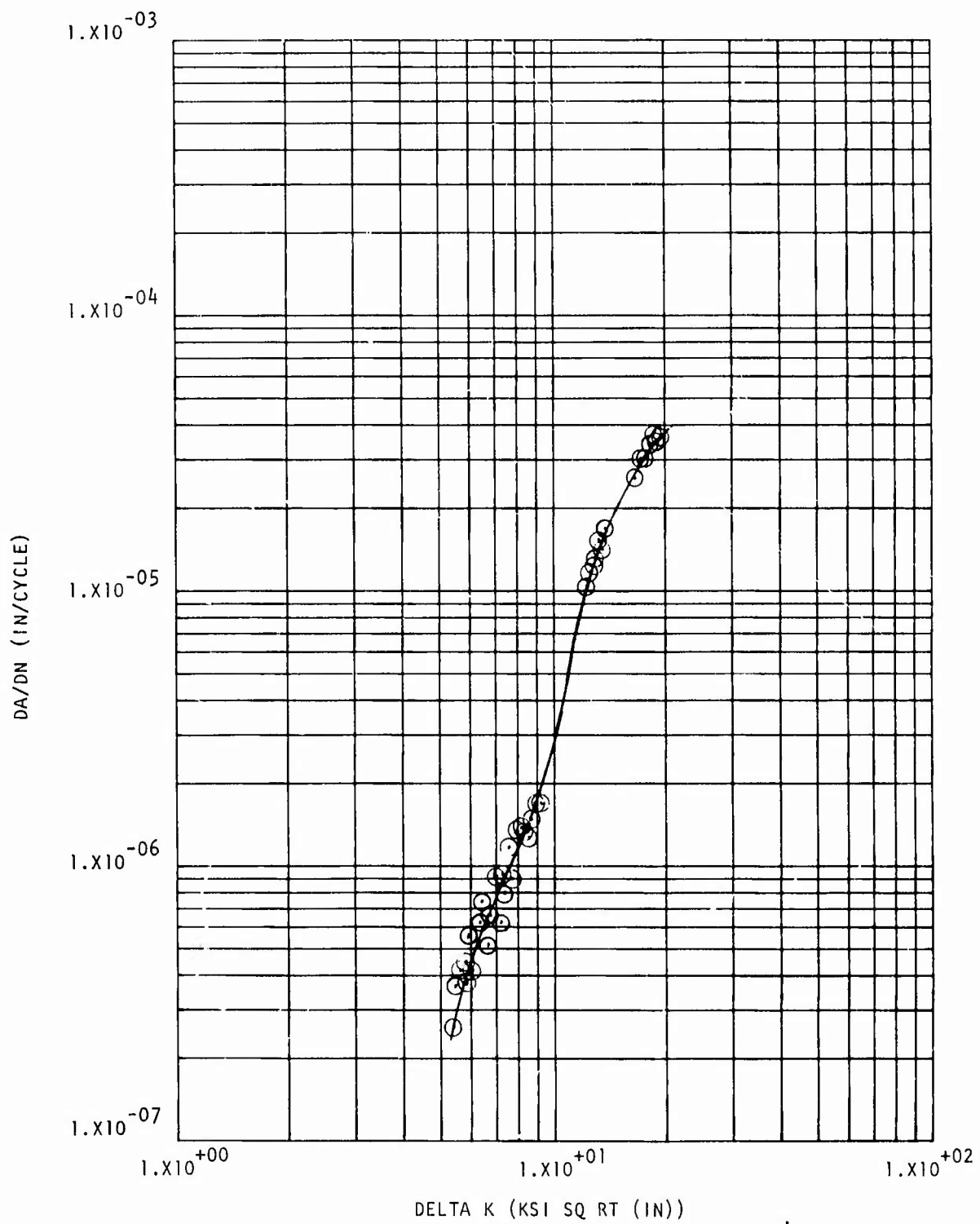
80 NRW 84-7 Ti-6Al-4V MA LHA RT R = 0.3 360 CPM



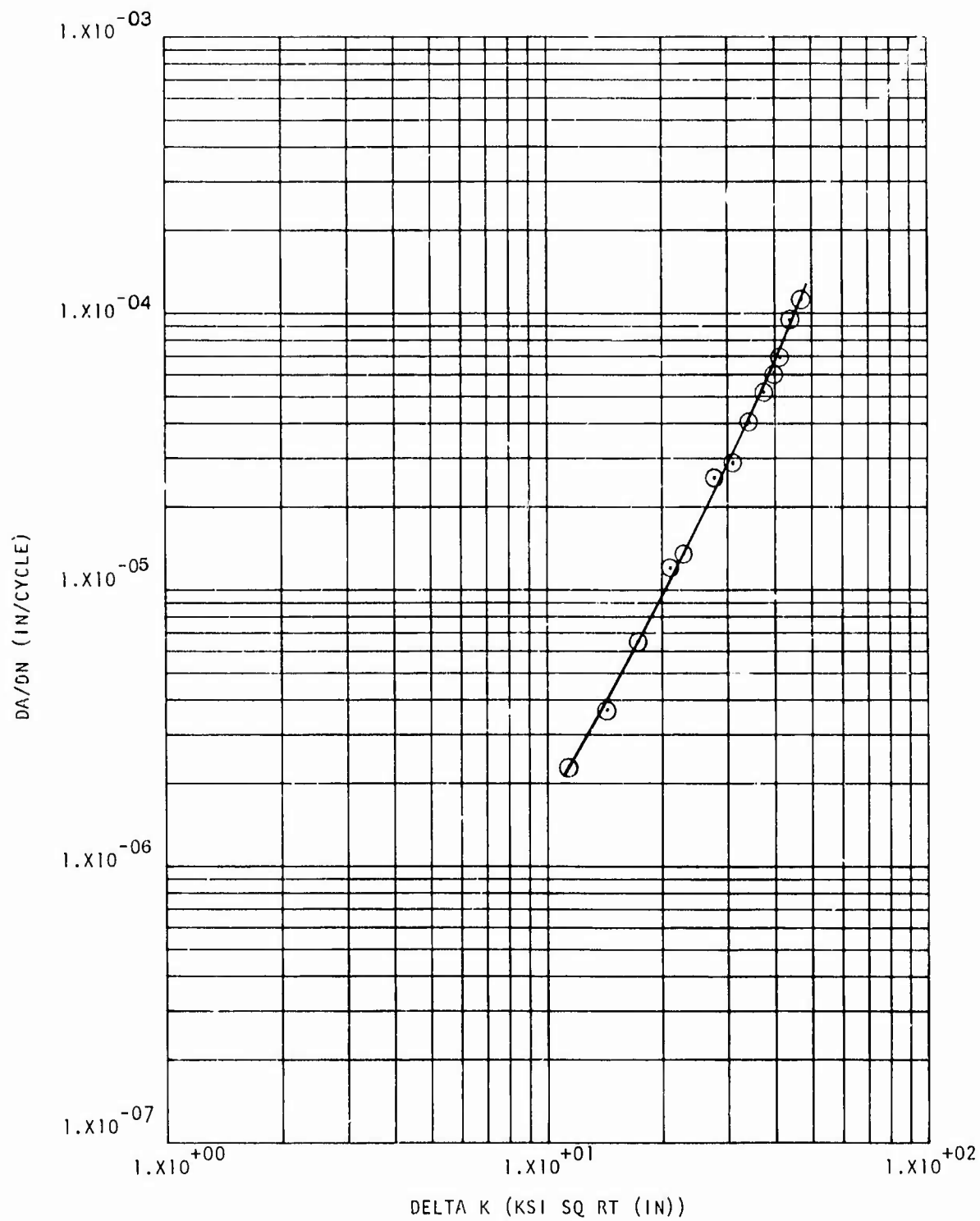
80 NRW 84-8 Ti-6Al-4V MA LHA RT R = 0.5 360 CPM



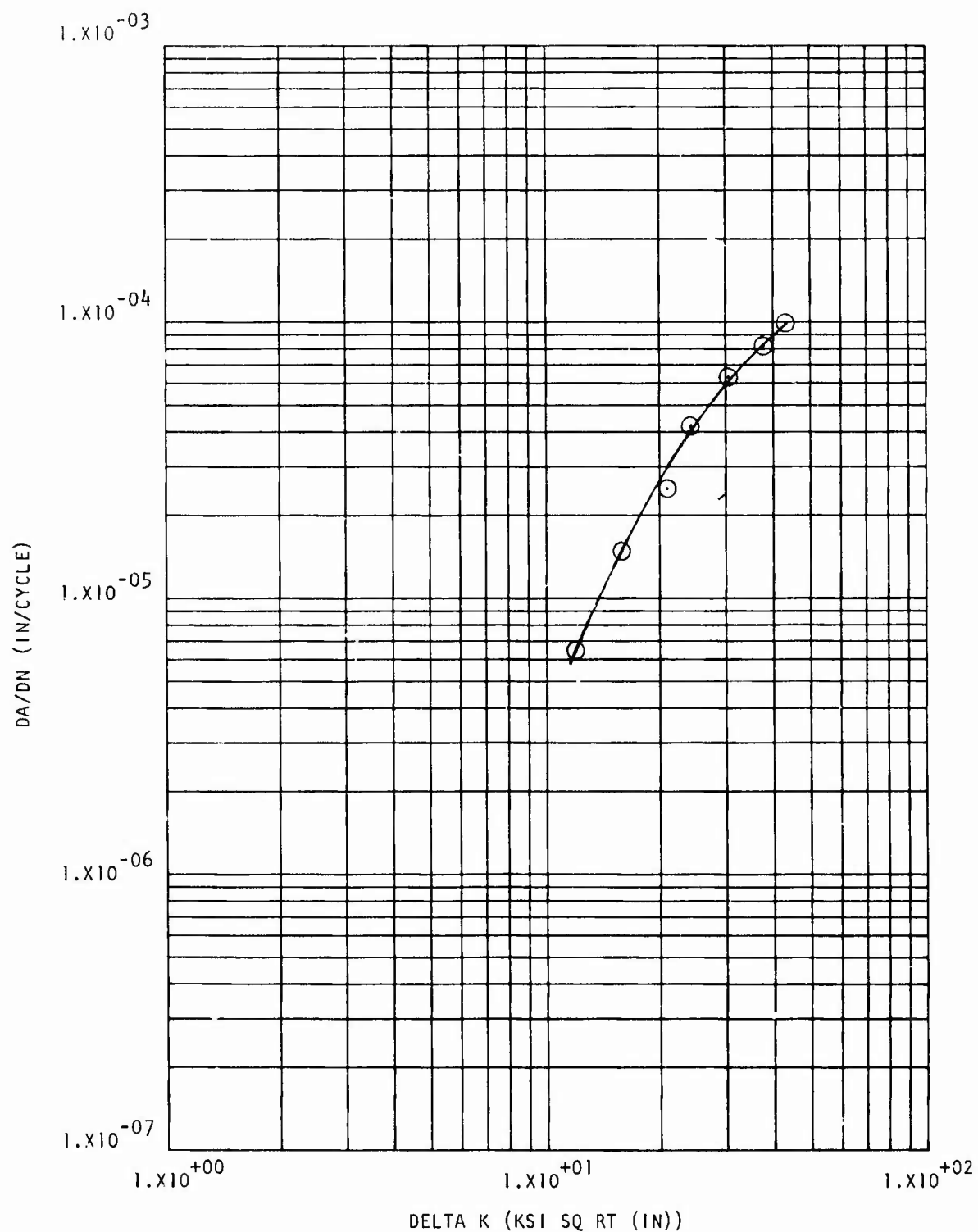
80 NRW 84-9 Ti-6Al-4V MA JP4 RT R = 0.08 360 CPM



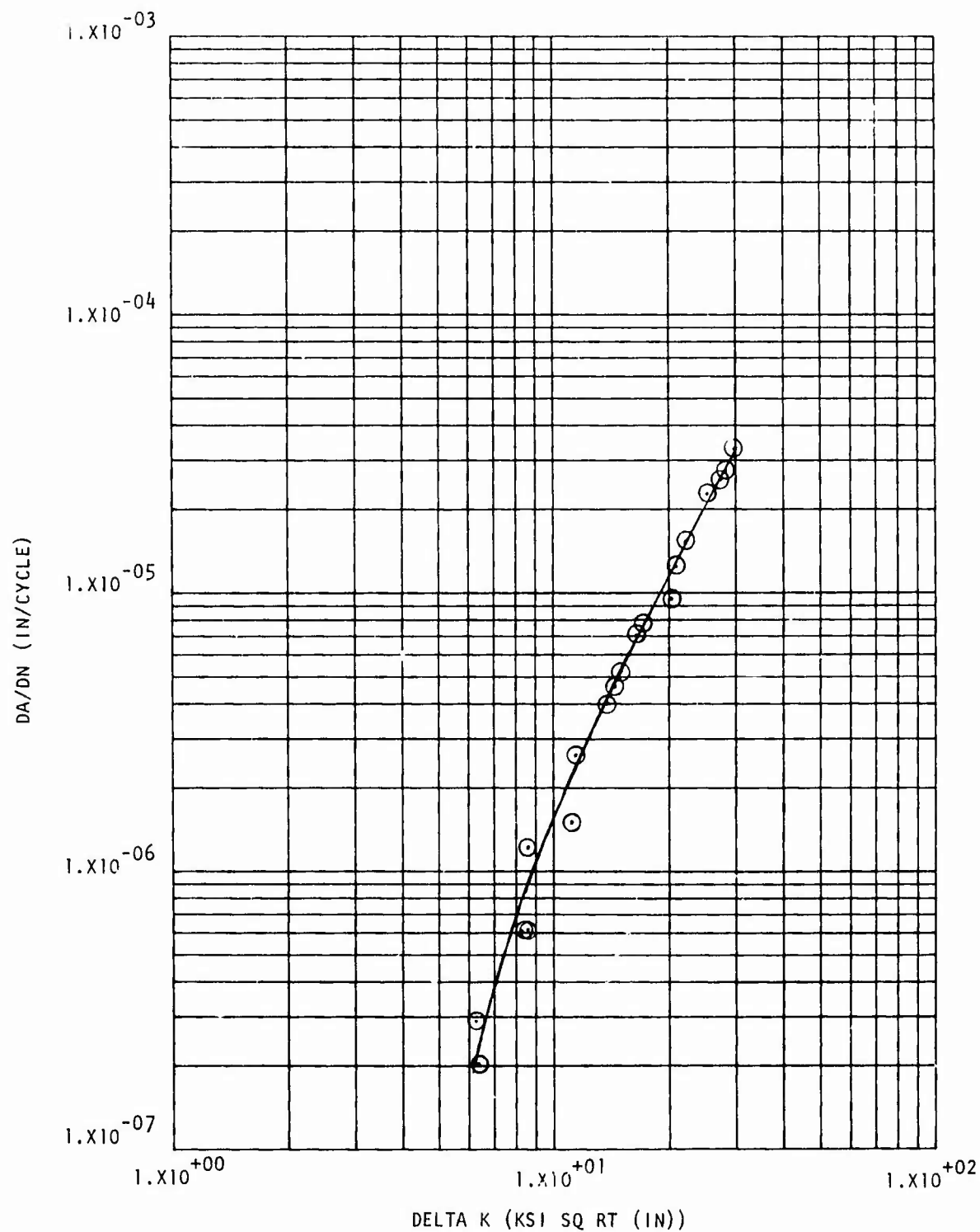
80 NRW 84-10 Ti-6Al-4V MA STW RT R = 0.08 60 CPM



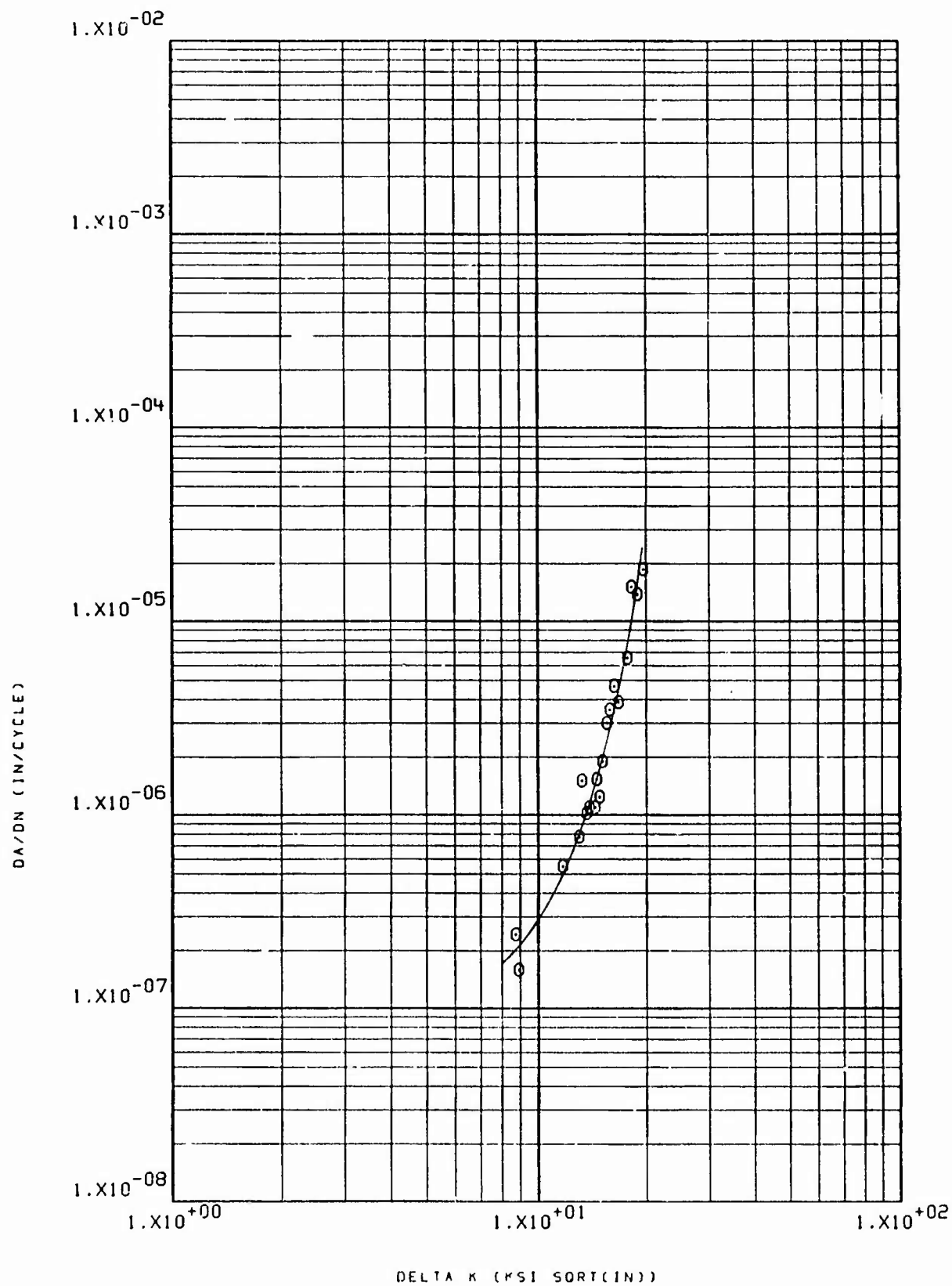
80 NWR 84-13 Ti-6Al-4V MA LHA RT R = 0.08 360 CPM



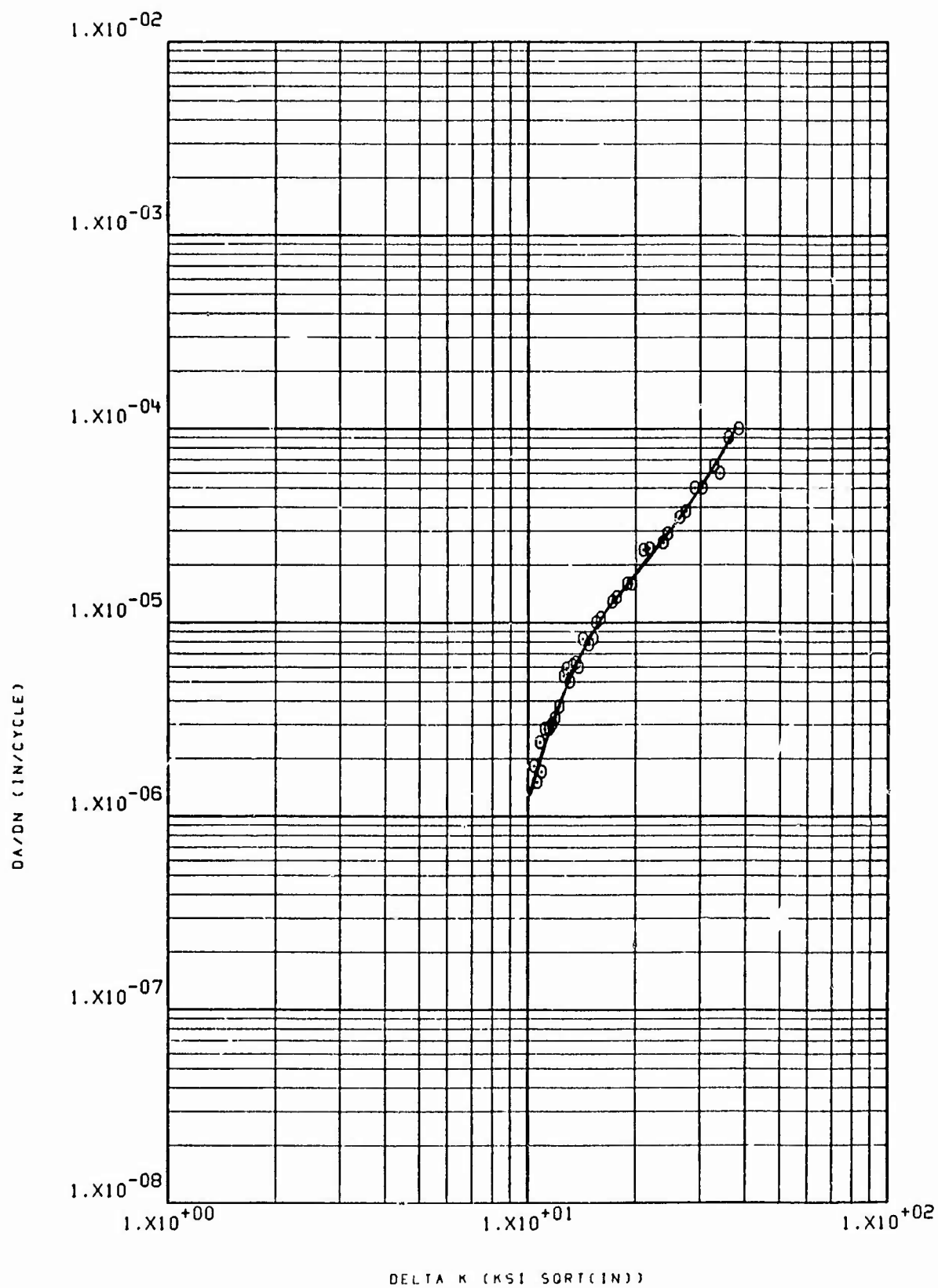
80 NWR 84-14 Ti-6Al-4V STW RT R = 0.08 360 CPM MA



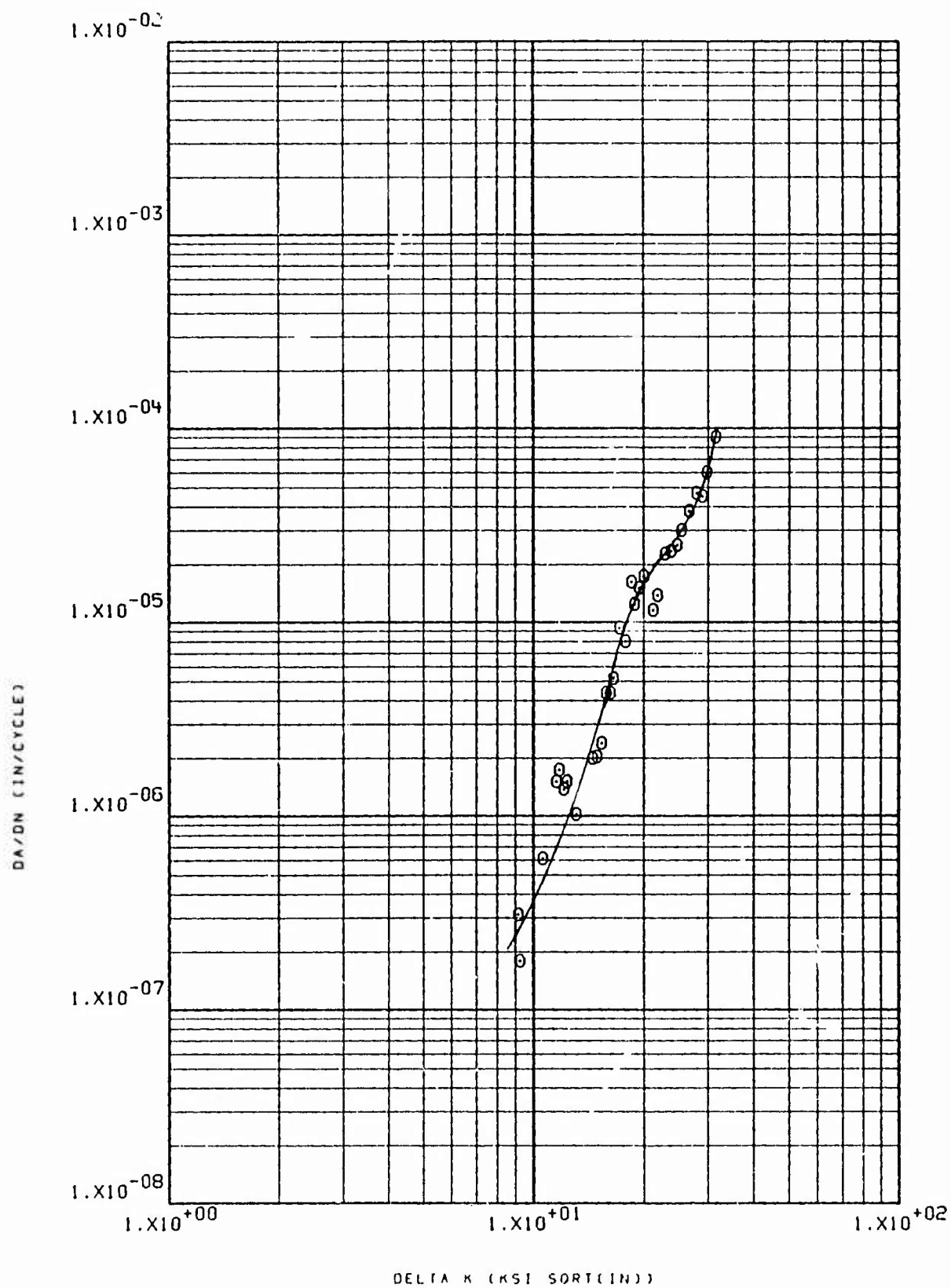
81 NRW 94-1 Ti-6Al-4V MA LHA RT R = 0.08 360 CPM



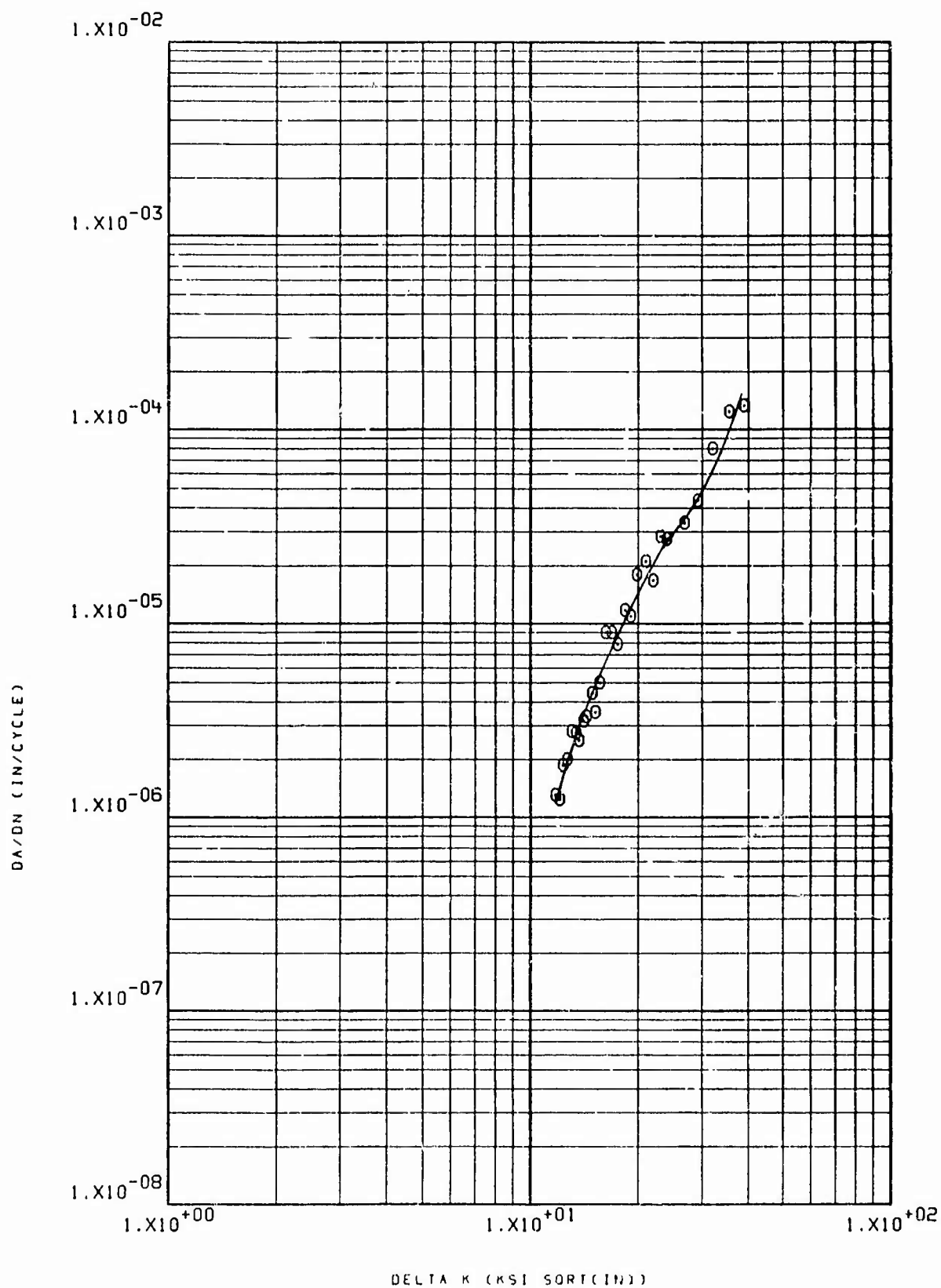
82 HPW 95-5 11-GAL-4V PA STW RT R=0.08 60CPH



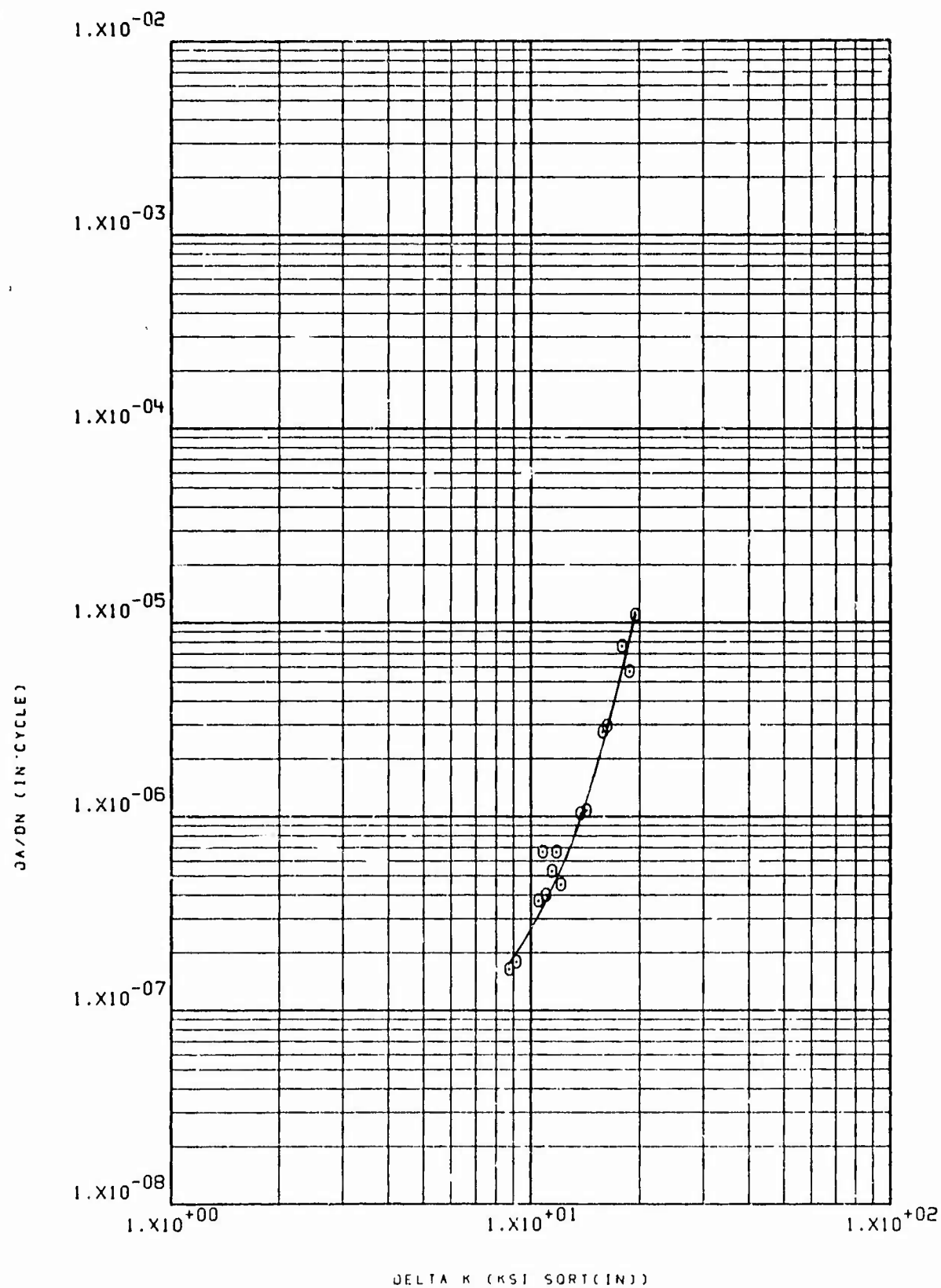
82 NWP 95-8 T1 6-4 RA HAND FORGING LHA RT R=0.5 360CPH



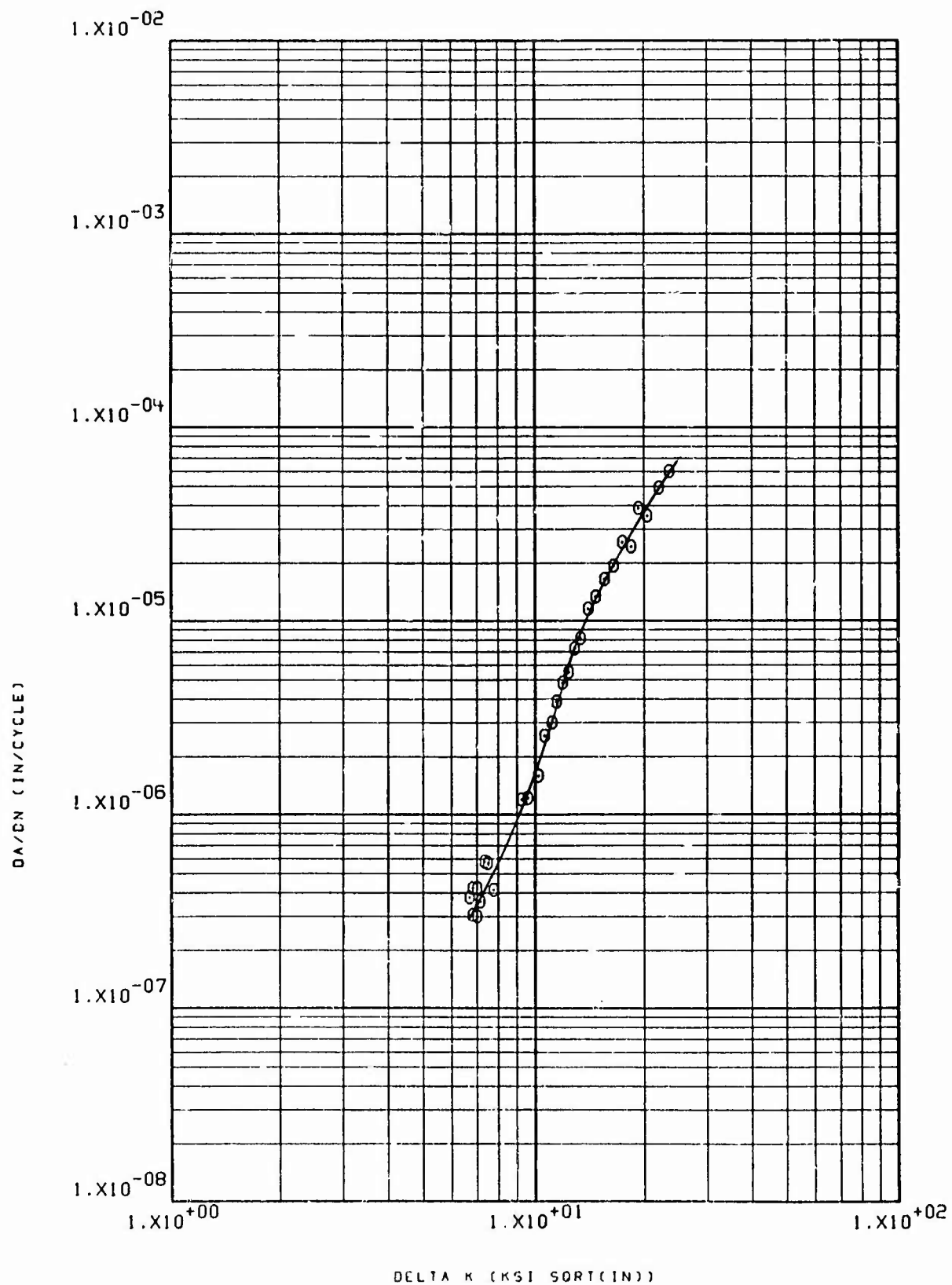
82 NWP 95-2 11-6AL-4V RA ST# RT R=.08 60CPM



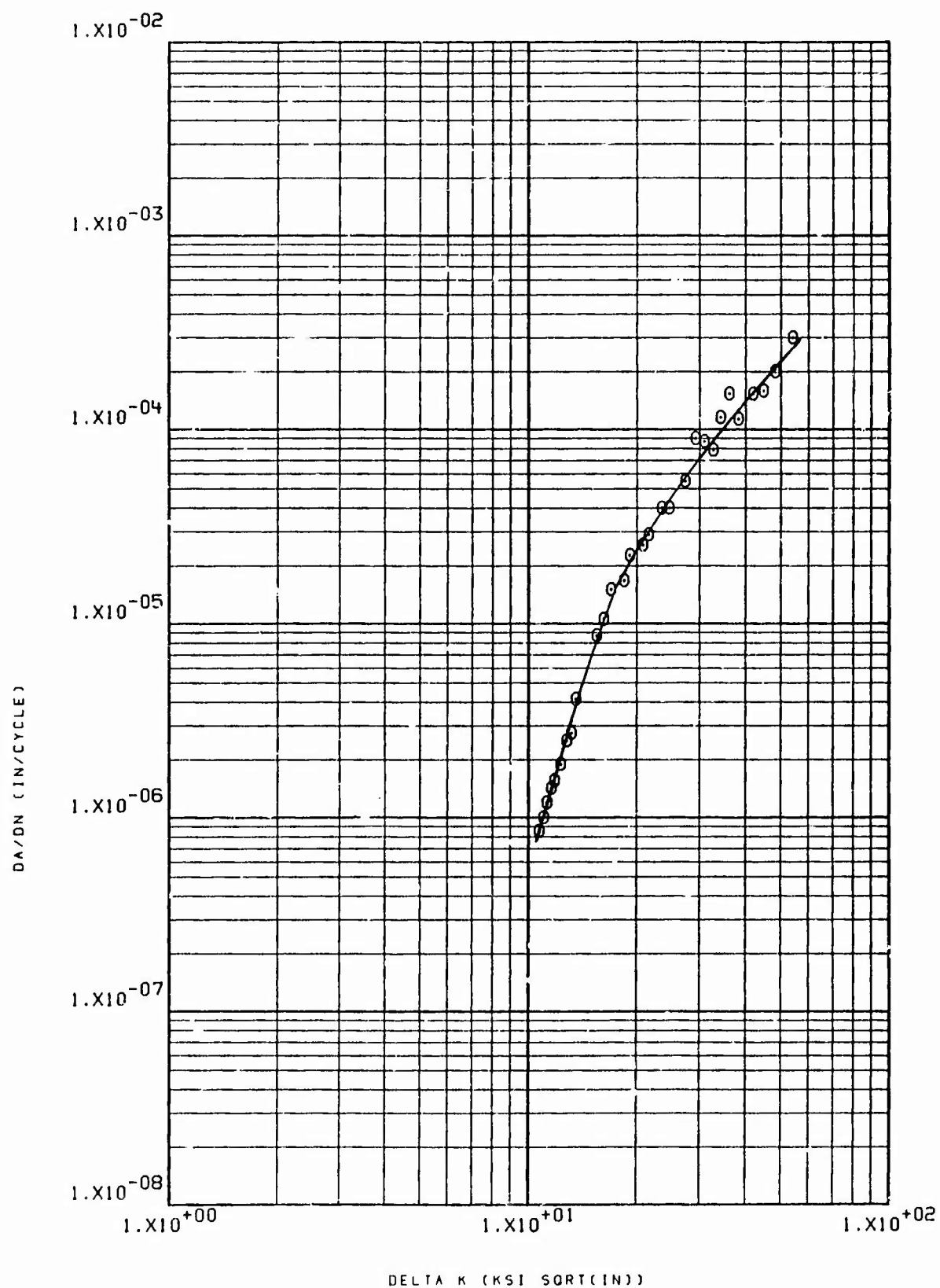
84 HWP 103-1 TI-6AL-4V RA SUMP RT P .08 60 CPM



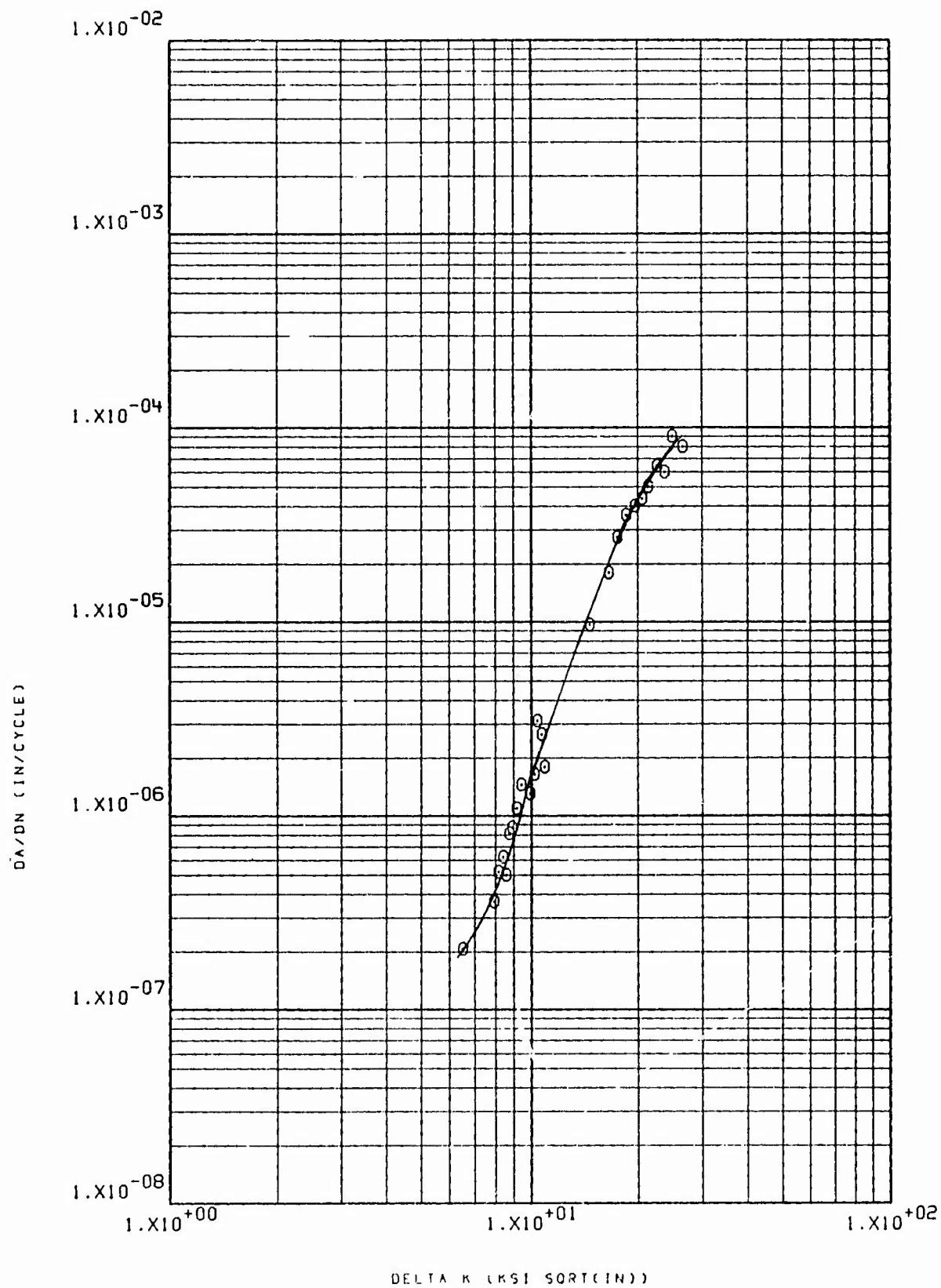
84 NPW 103 2 11-GAL-4V PA SIW RT R=.08 60CPM



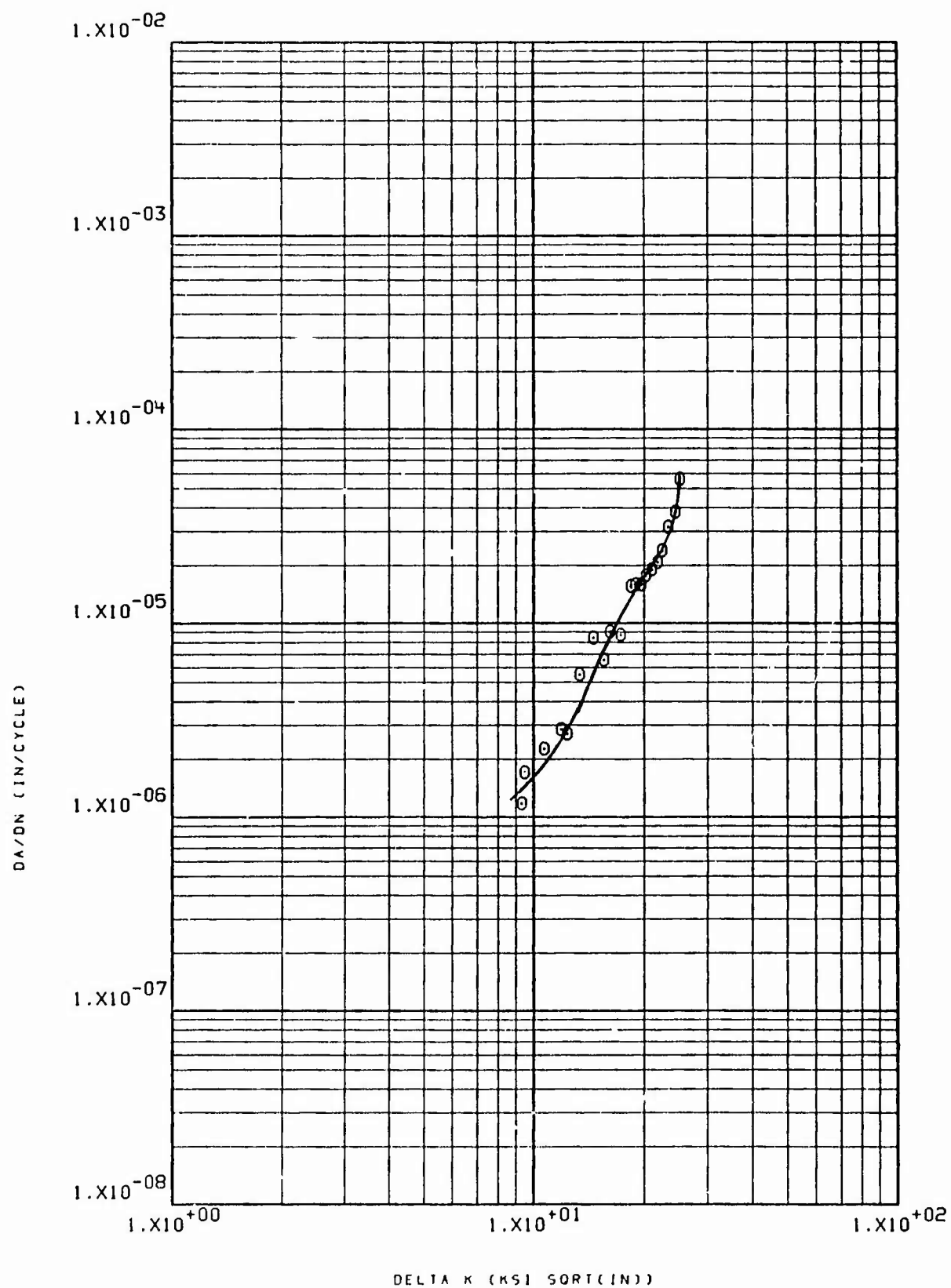
85 MPa 104-1 TI-6AL-4V RA SIW RT R=0.08 60CPH



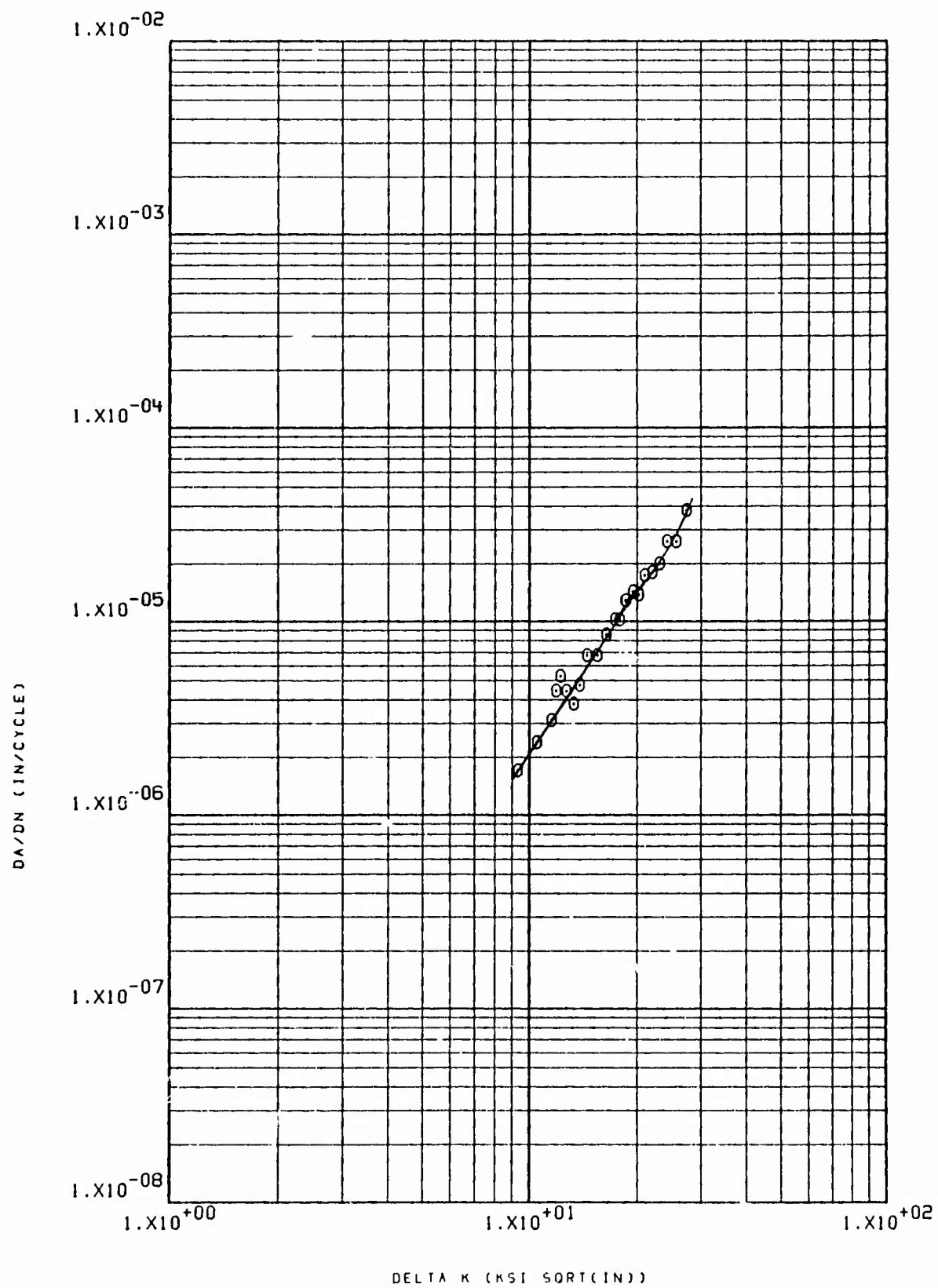
85 NWP 104-2 TI-6AL-4V RA SUMP RT R: .08 60CPH



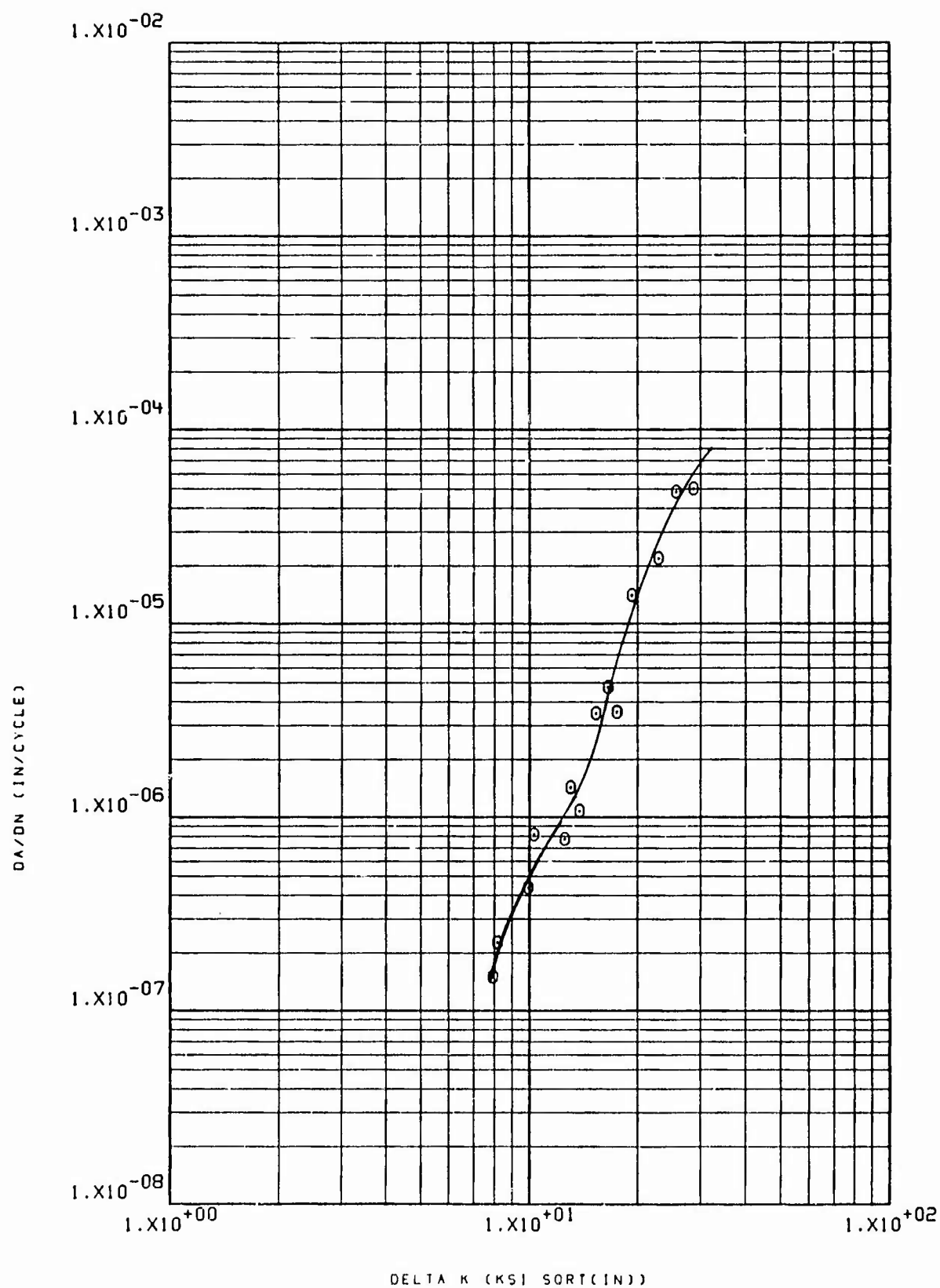
86 NRP 107-1 11 GAL-4V PA 51W RT R=1.08 60CPH



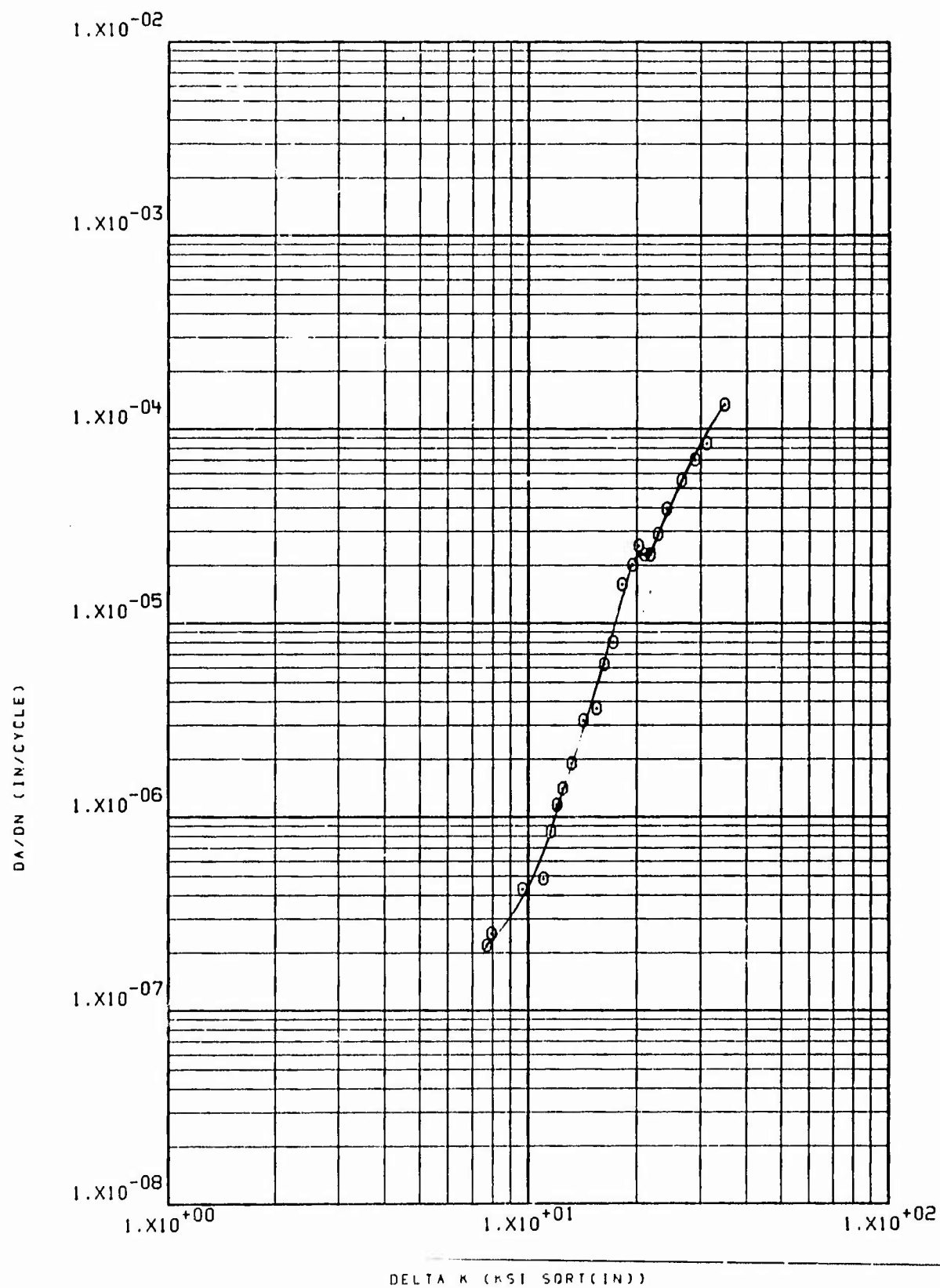
90 HPW 032A 11-GAL-4V DB(PW/RW) SUMP RT 60CPM R=.08



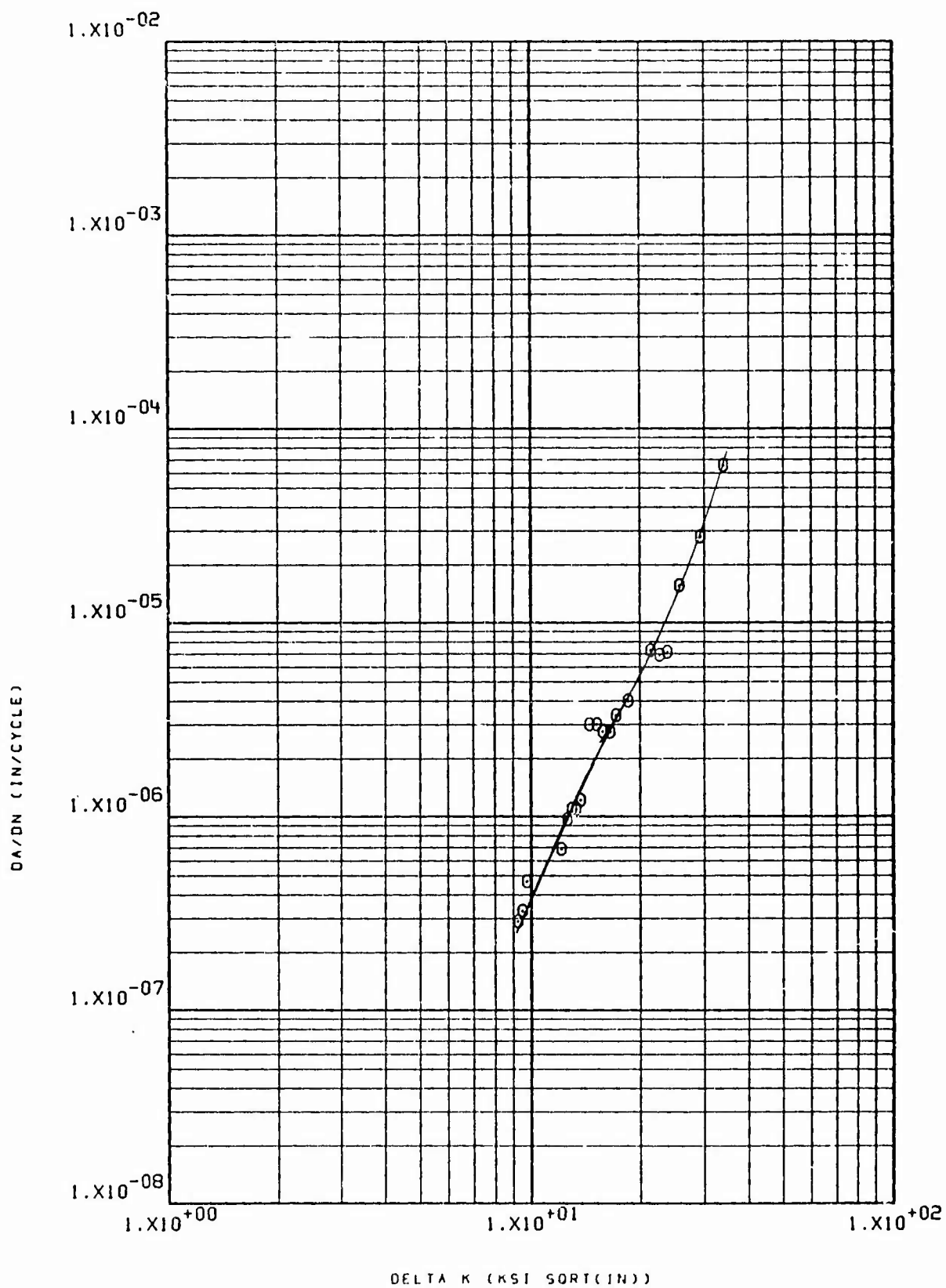
11WR 032D T1-6AL-4V DB(WR/WR) STW RI 60CPM R=.08



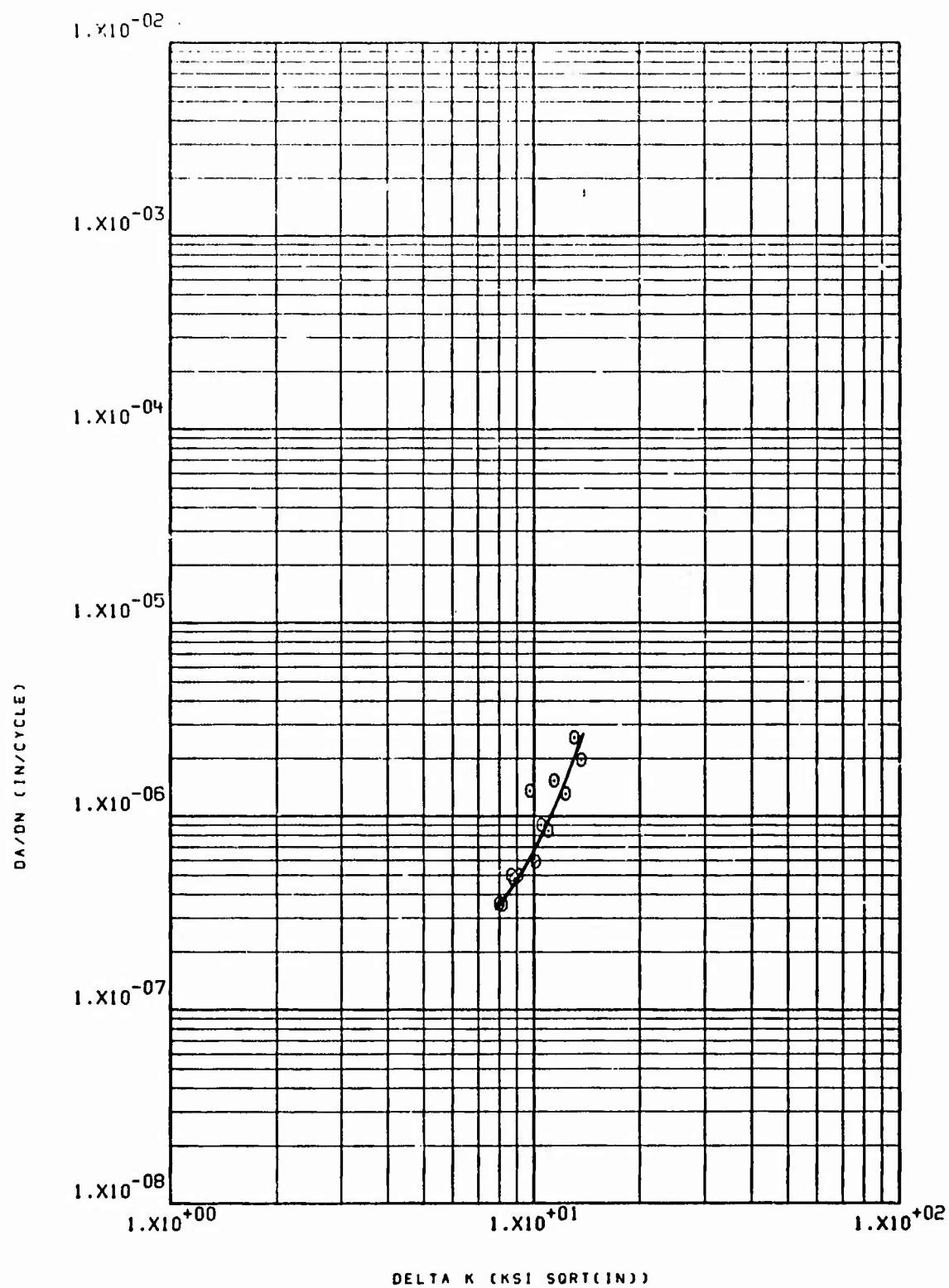
253 HPW 10-20 11-GAL-4V RA STW RT R=.08 60CPM



294 HPW 1022 TI 6AL-4V RM RA STW RT R=1.09 60CPM

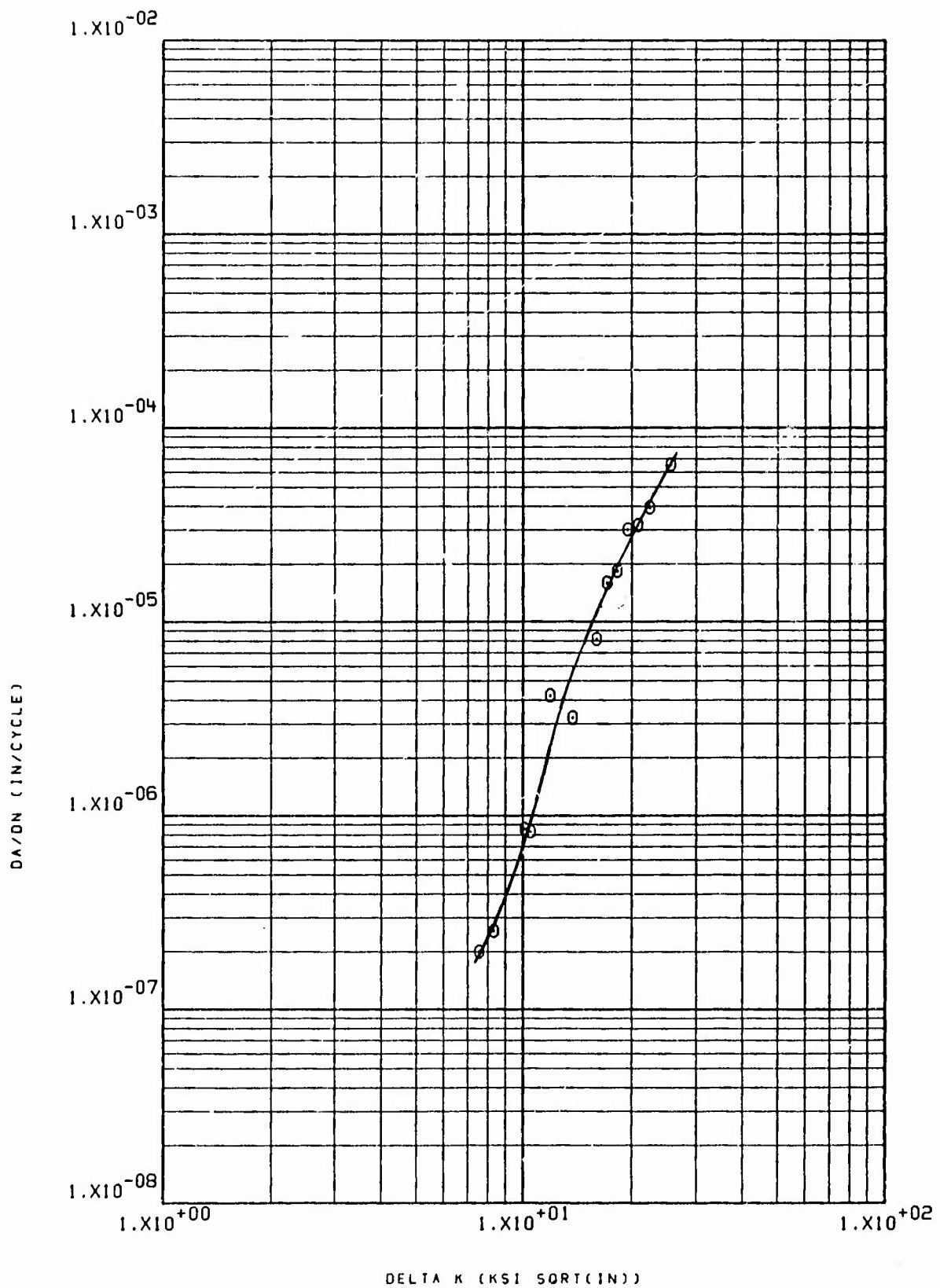


7406 HRW 101EA 11 GAL-4V RA SUMP RT P .08 60CPH

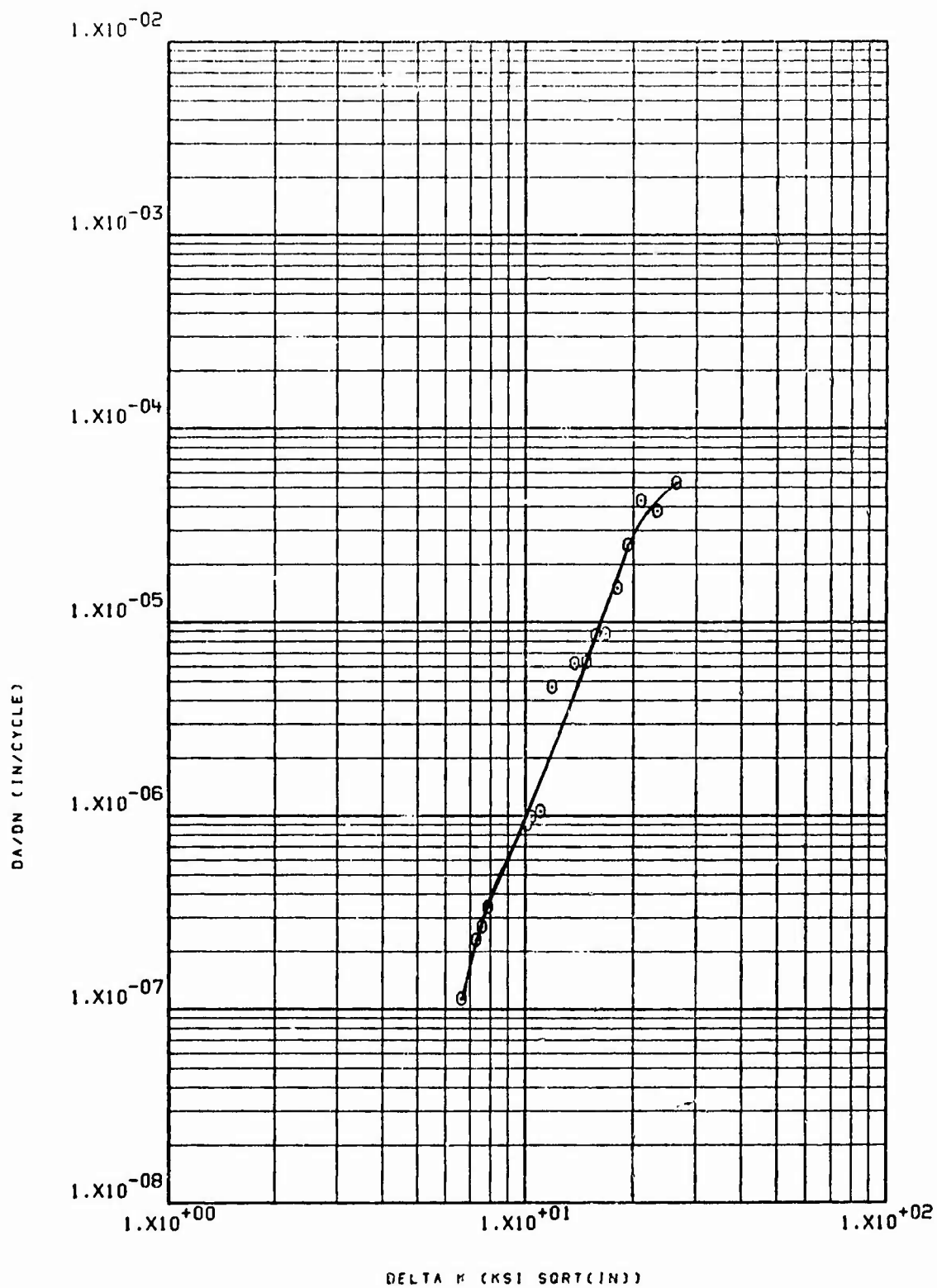


7768 NRW 1017A T1-6AL-4V RA

STW RT R=0.08 60CPH

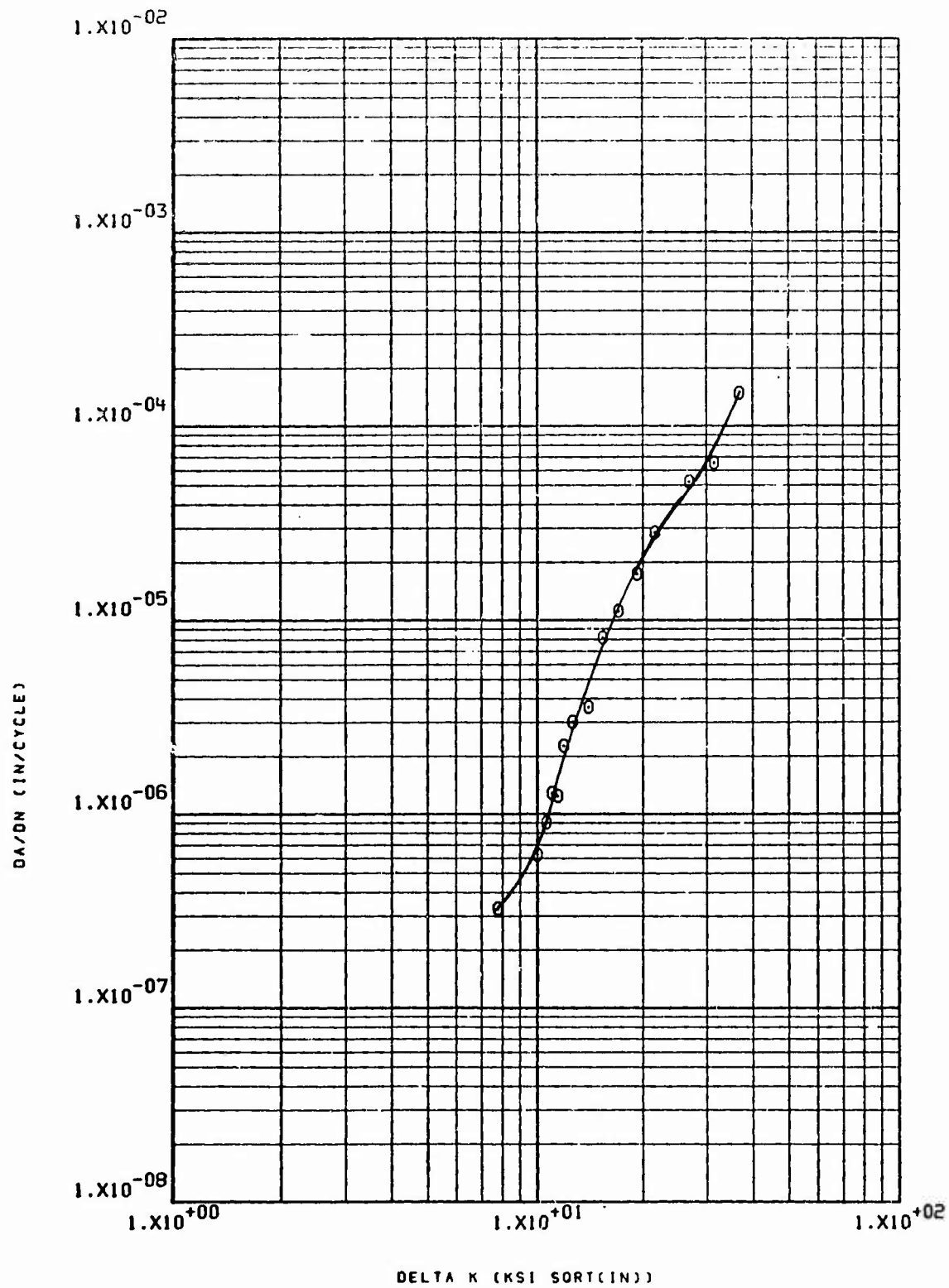


L1200021 N-1 T1-6AL-4V SUMP RT R=.08 60CPM



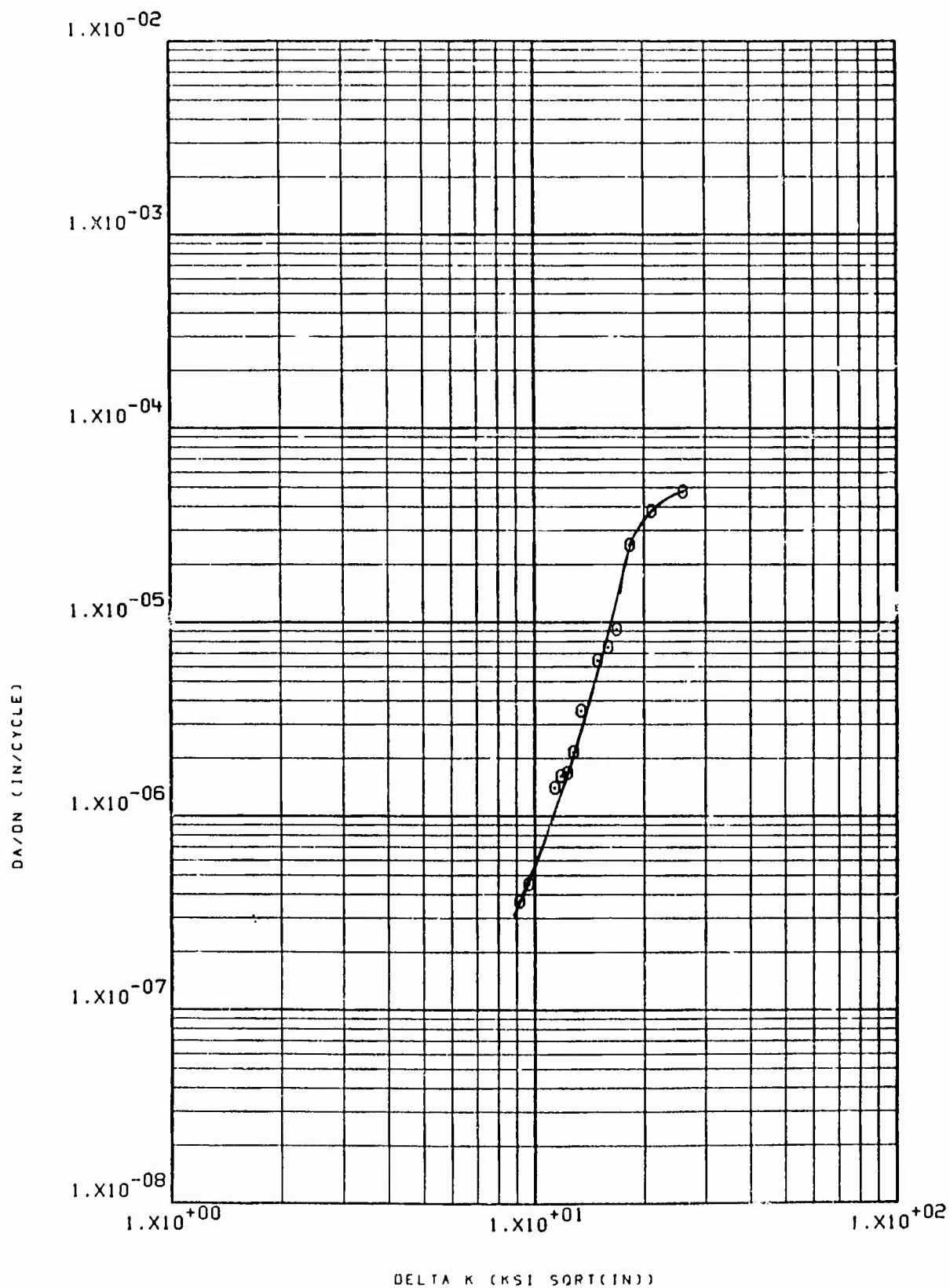
LI 200021 N-2 TI-6AL-4V

STW RT R=0.08 60CPH

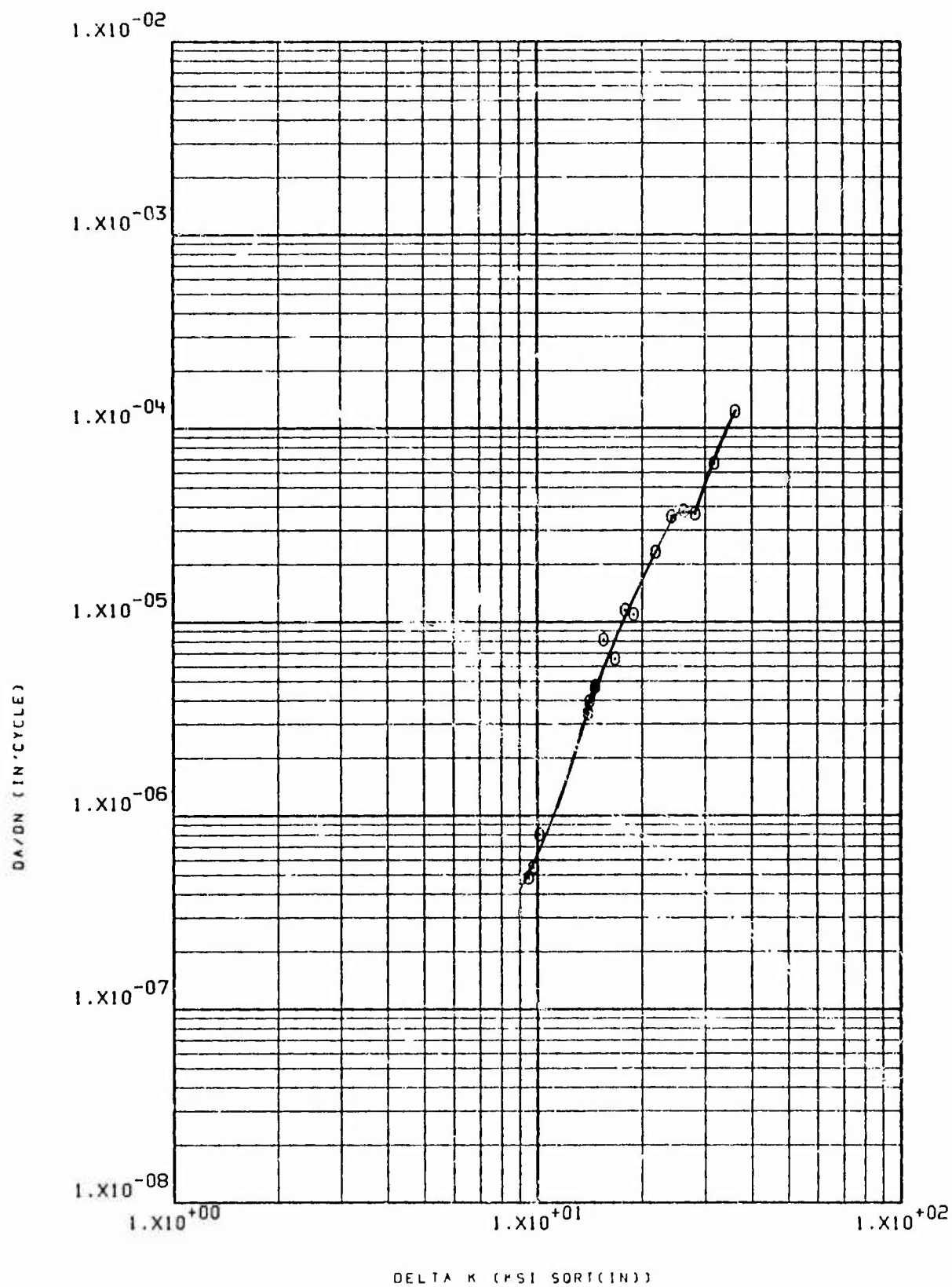


LI 200021 0-3 TI-6AL-4V

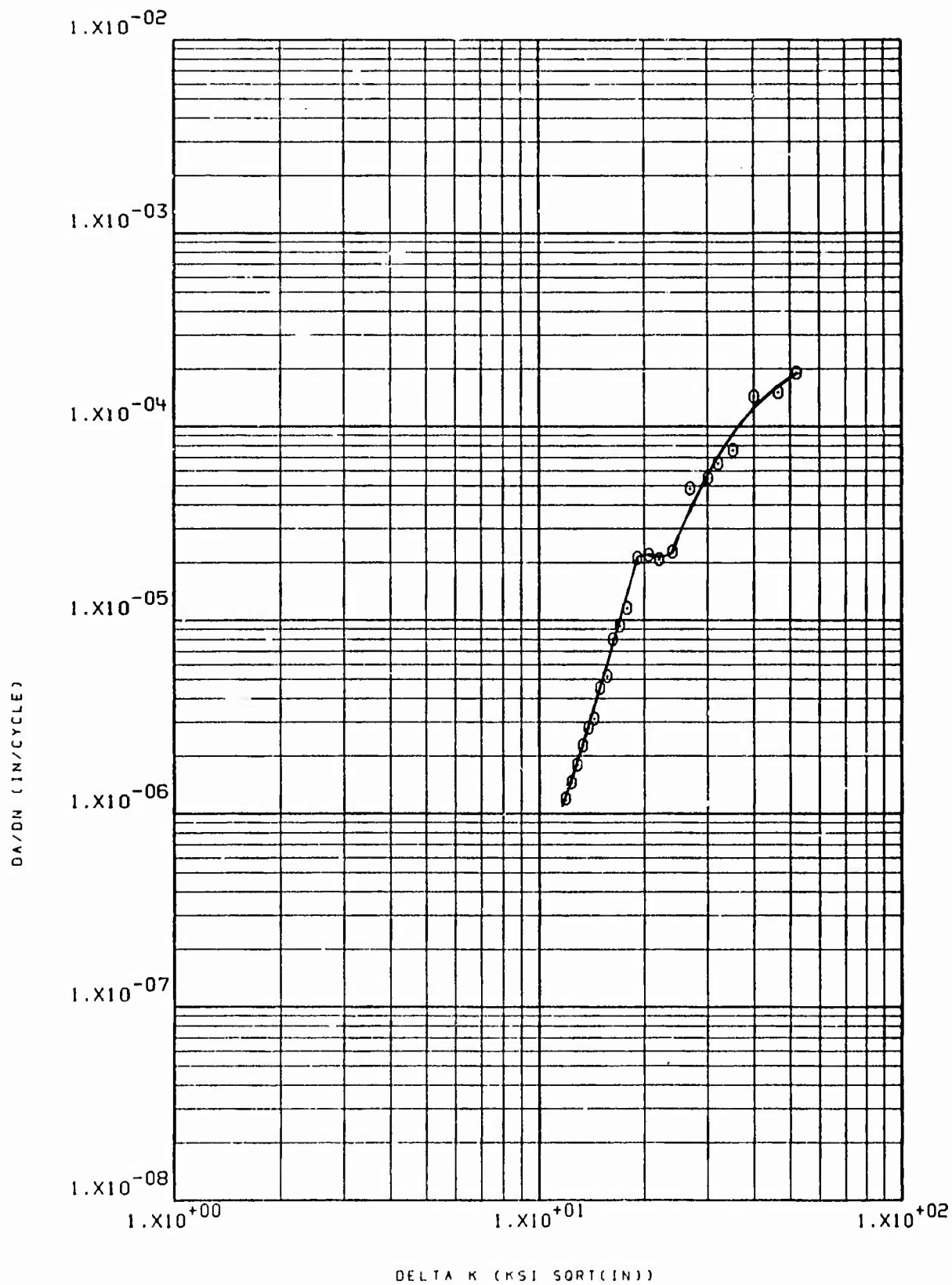
STW RT R=0.08 60CPH



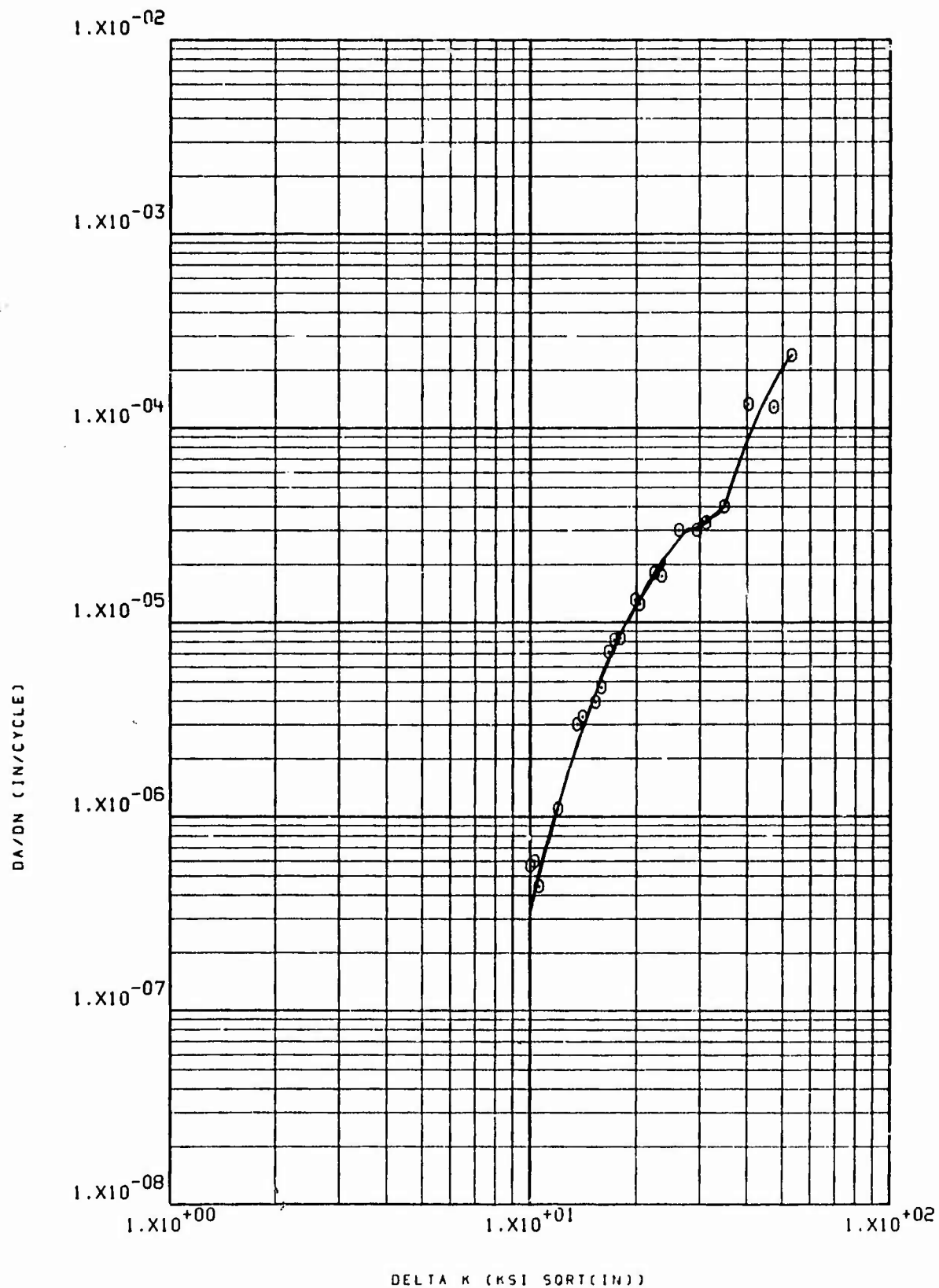
L1200021 0.4 TI-6AL-4V SUPP RT R-.08 60CPM



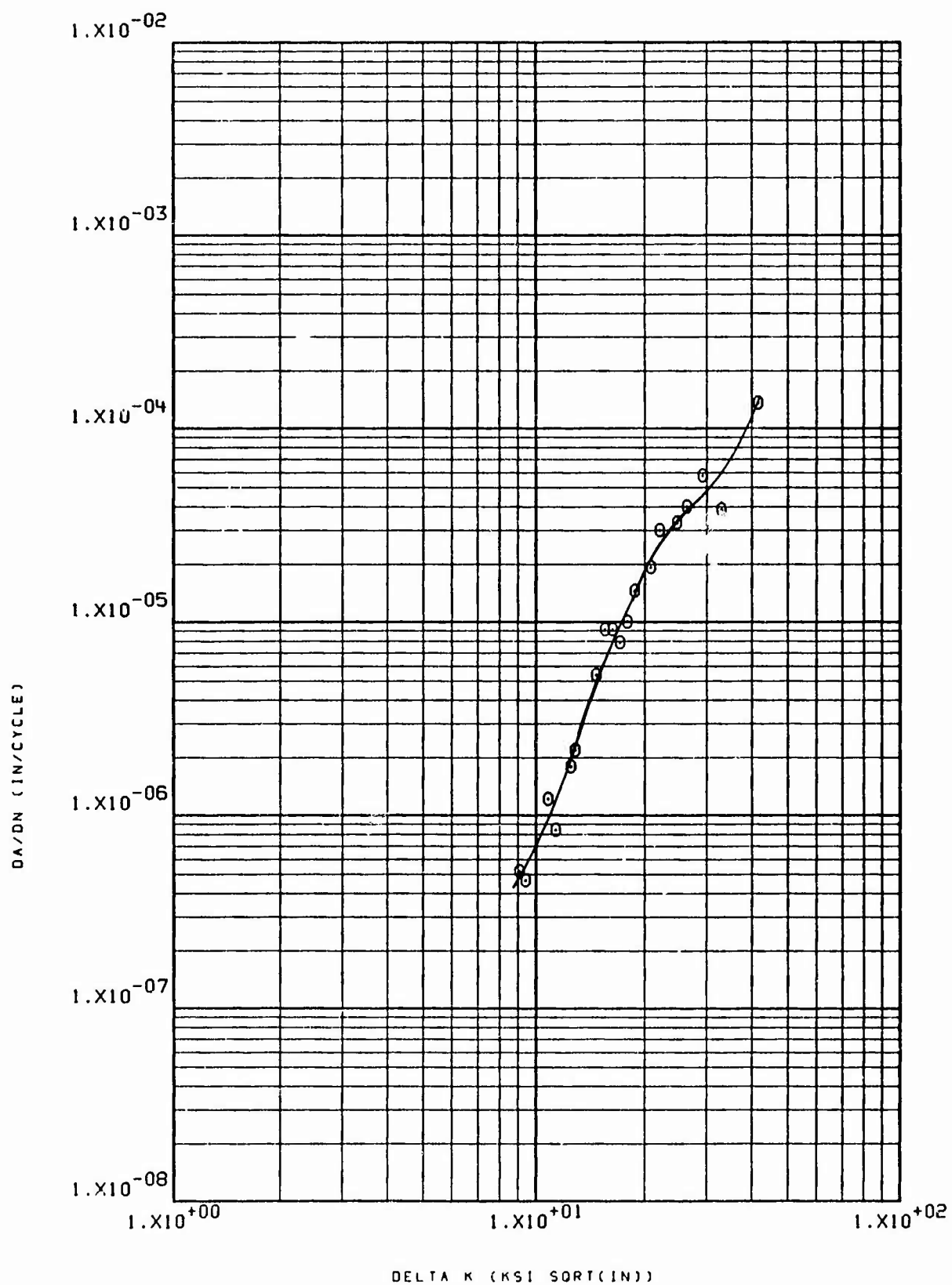
2003-1 HPW/IR T1 6AL-4V DB WITH MICROPOSSISITY SIW RT R-08 60CPH

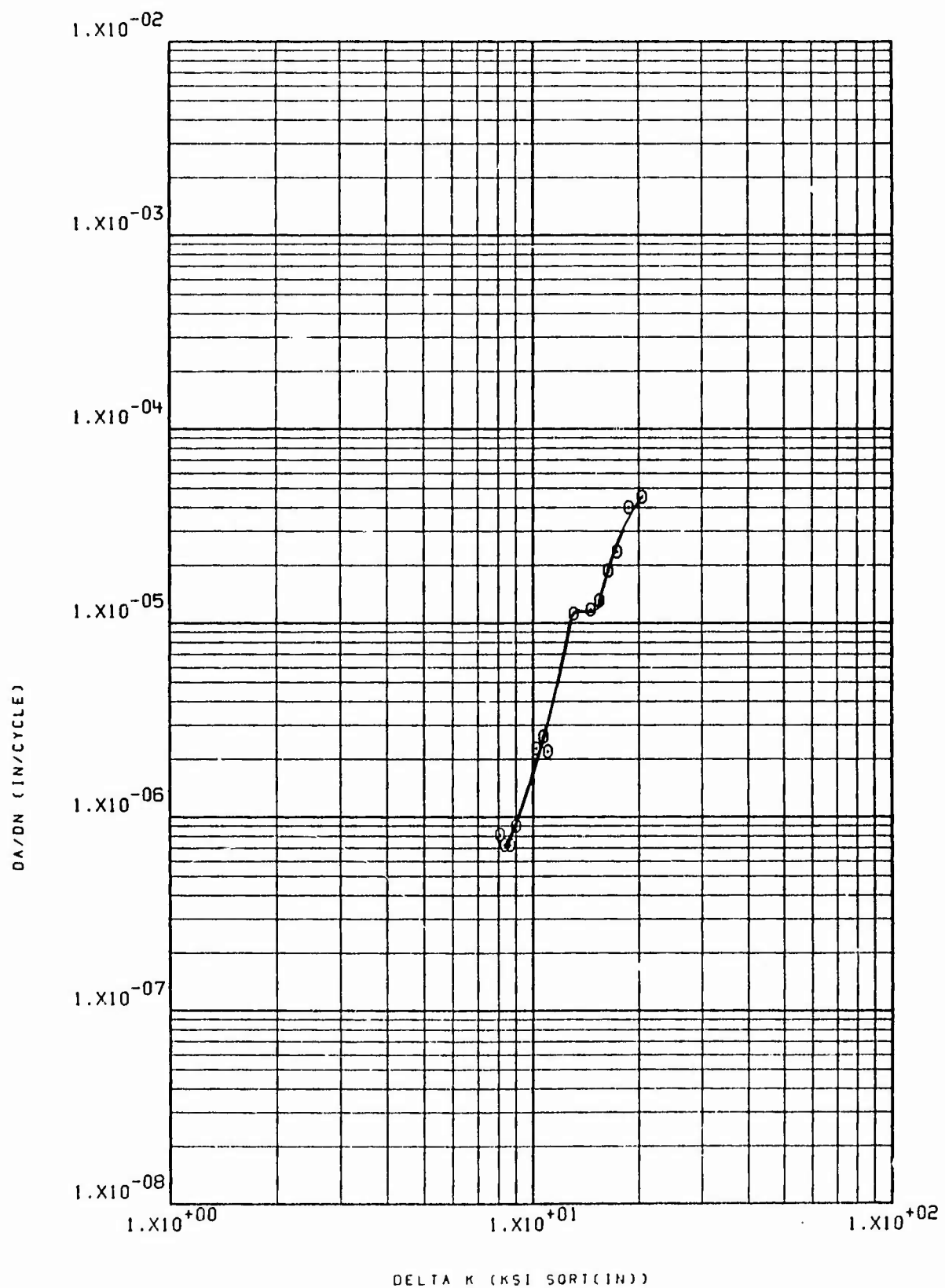


2004-1 NPW/TP II GAL-4V DB WITH MICROPOROSITY STW RT R=.08 60CPM

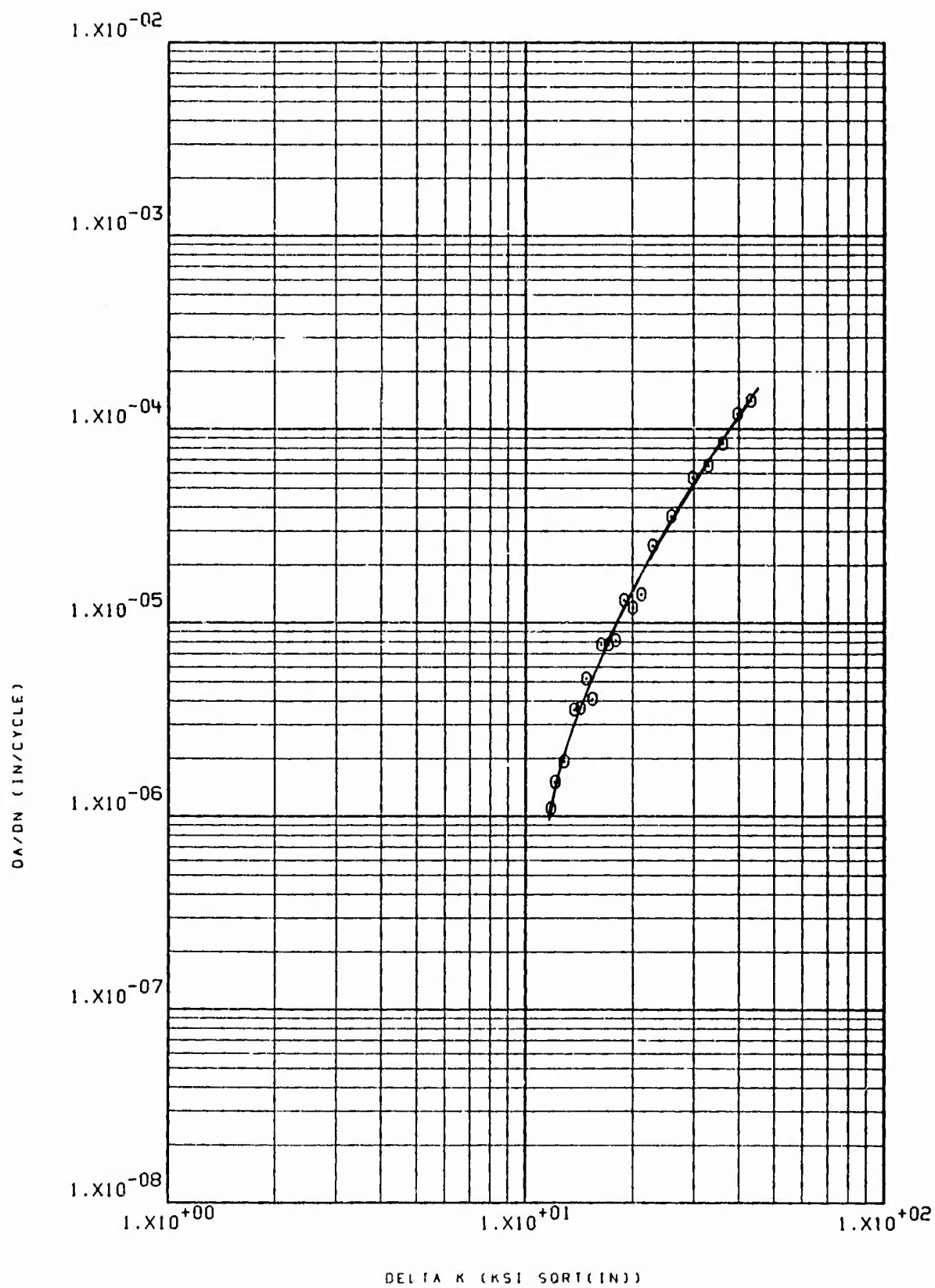


2DC5-1 HRW/TR T1 GAL-4V DB WITH MICROPOPOSITIVY SIW RT R=.08 60CPH

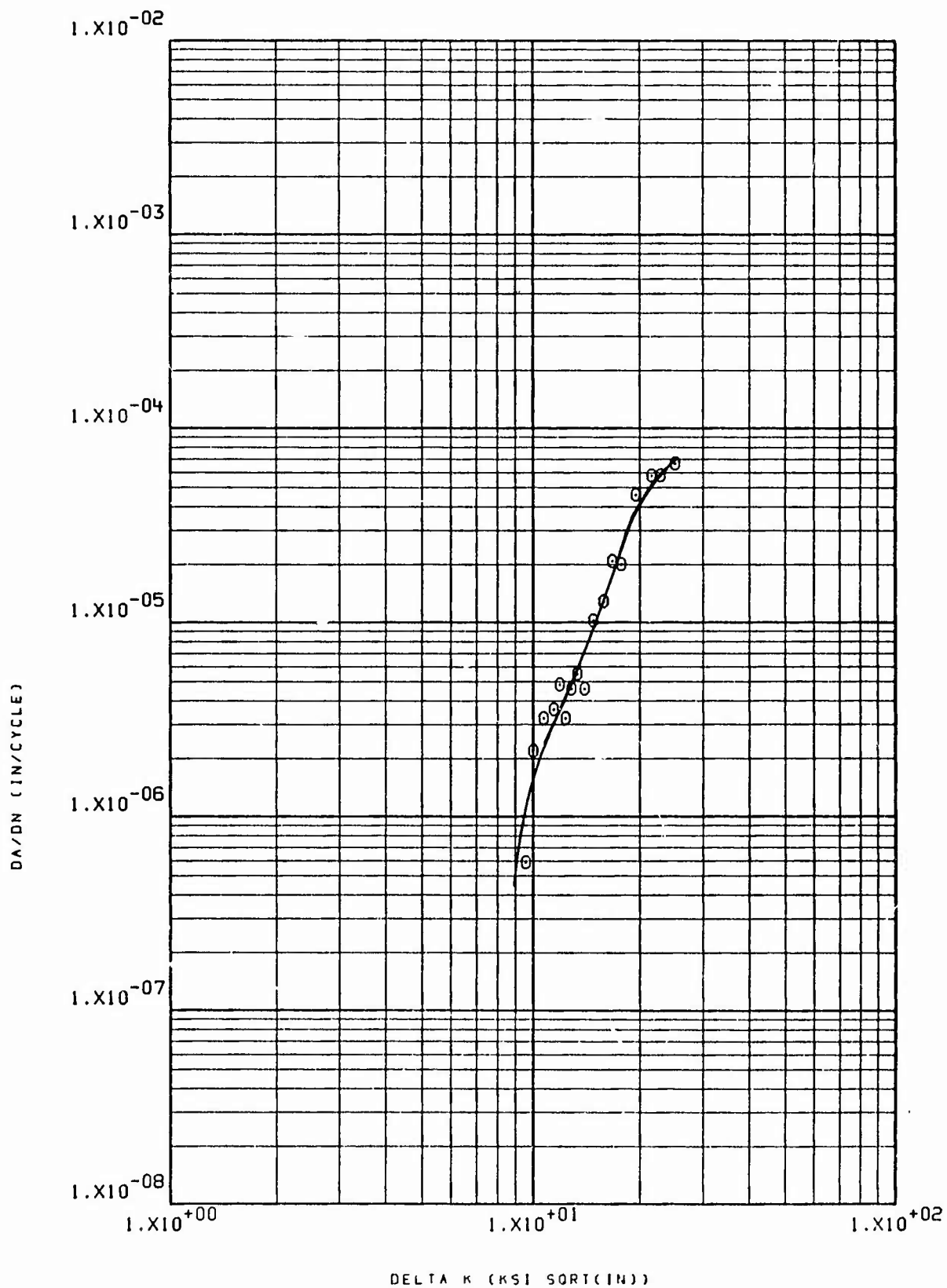




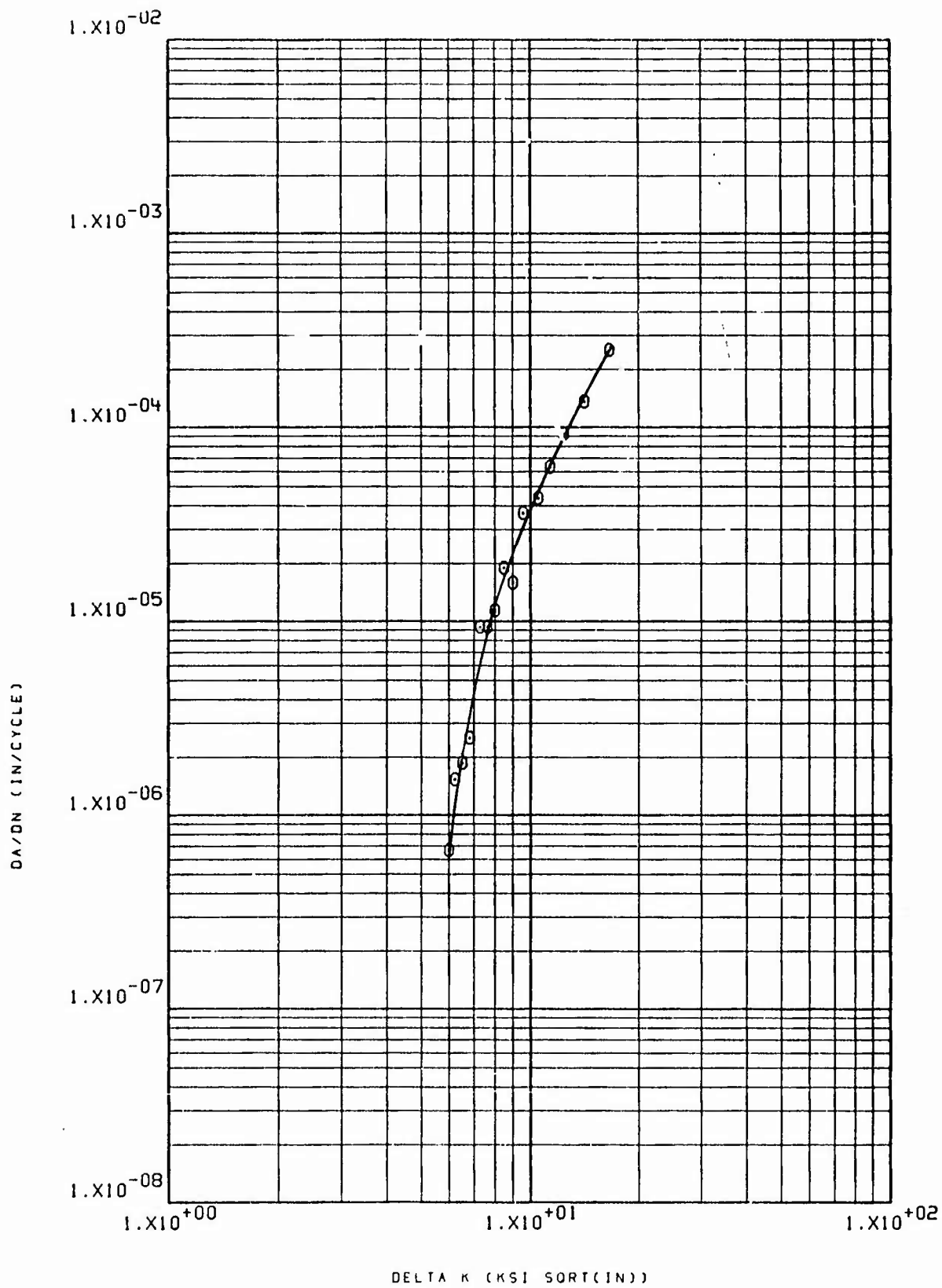
30A3-1 NWR/TP 11 GAL-4V DB WITH MICROPOROSITY STW RT R=.08 60CPH



3DA4-1 NWR/TP T1 6AL-4V DB WITH MICROPOROSITY STW RT R-.08 60CPM



30A5-1 HWR/TP T1 GAL-4V DB WITH MICROPOROSITY STW RT R=.08 60CPH



40A6-1 NWR/TP T1 6AL-4V DB WITH O2 ENRICHMENT STW RT R=1.08 60CPM

B-1 Division
North American Rockwell

APPENDIX B

FATIGUE CRACK GROWTH RATE CURVES

FOR ALL ALUMINUM ALLOY TESTS

APPENDL. : INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environ-ment	Test Temp	"R"	Freq (CPM)	Page No.
2024-T851	1 NRW 3	RW	6.0	0.6	1.0	LHA	R.T.	0.08	60	B-1
"	1 NRW 4	RW	6.0	0.6	1.0	LHA	R.T.	0.3	60	B-2
"	1 NRW 7	WR	6.0	0.6	1.0	LHA	R.T.	0.08	60	B-3
"	1 NRW 8	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-4
"	1 NRW 11	RW	6.0	0.6	1.0	LA	R.T.	0.05	1800-7800	B-5
"	1 NRW 1C	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-6
2024-T62	1 NRW 18	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	B-7
2024-T651	1 NRW 19	RW	6.0	0.6	1.0	Dist H ₂ O	R.T.	0.08	60	B-8
"	1 NRW 20	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	B-9
"	1 NRW 6-44	RW	6.0	0.6	0.5	LHA	R.T.	0.08	60	B-10
2024-T851	3 NRW 8-33	RW	6.0	0.6	1.0	LHA	R.T.	0.08	60	B-11
"	3 NRW 8-34	RW	6.0	0.6	1.0	LHA	R.T.	0.08	60	B-12
"	3 NRW 8-52	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-13
"	3 NRW 8-53	RW	6.0	0.6	1.0	JP4	R.T.	0.08	60	B-14
"	3 NRW 8-107	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	B-15
2219-T851	4 NRW 9-11	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-16
"	4 NRW 9-12	RW	6.0	0.6	1.0	LHA	R.T.	0.08	60	B-17
"	4 NRW 9-14	RW	6.0	0.6	1.0	Dist H ₂ O	R.T.	0.08	60	B-18
"	4 NRW 9-15	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-19
"	4 NRW 9-19	RW	6.0	0.6	1.0	STW	P.T.	0.08	360	B-20
"	4 NRW 9-20	RW	6.0	0.6	1.0	Dist H ₂ O	R.T.	0.08	60	B-21
"	4 NRW 9-54	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-22
7075-T7651	5 NRW 17-1	RW	6.0	0.6	0.8	LHA	R.T.	0.03	360	B-23
7075-T7351	5 NRW 17-4	RW	6.0	0.6	0.8	LHA	R.T.	0.08	360	B-24
7075-T7651	5 NRW 17-5	RW	6.0	0.6	0.8	LHA	R.T.	0.3	360	B-25
7075-T7351	5 NRW 17-8	RW	6.0	0.6	0.8	STW	R.T.	0.08	360	B-26
7075-T7651	5 NRW 17-9	RW	6.0	0.6	0.8	LHA	R.T.	0.08	60	B-27
7075-T7351	5 NRW 17-10	RW	6.0	0.6	0.8	LHA	R.T.	0.5	360	B-28
7075-T7651	5 NRW 17-11	RW	6.0	0.6	0.8	STW	R.T.	0.08	60	B-29
7075-T7351	5 NRW 17-14	RW	6.0	0.6	0.8	LHA	R.T.	0.08	360	B-30
"	5 NRW 17-16	WR	6.0	0.6	0.8	LHA	R.T.	0.08	360	B-31

NOTE: All figures on this page are for CT specimens.

APPENDIX B: INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
2219-T851	7 NWR 27-2	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	B-32
"	7 NWR 27-6A	RW	2.0	0.6	1.0	LA	R.T.	0.08	360	B-33
"	7 NWR 27-12	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	B-34
"	7 NWR 27-13	RW	6.0	0.6	1.0	LHA	R.T.	0.5	360	B-35
"	7 NWR 27-19	RW	6.0	0.6	1.0	STW	R.T.	0.5	60	B-36
"	7 NWR 27-20	RW	6.0	0.6	1.0	LHA	R.T.	0.08	6	B-37
"	7 NWR 27-24	RW	6.0	0.6	1.0	LHA	265	0.08	360	B-38
"	7 NWR 27-25	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-39
"	7 NWR 27-26	RW	6.0	0.6	0.5	STW	R.T.	0.08	6	B-40
"	7 NWR 27-27	RW	6.0	0.6	1.0	SCS	R.T.	0.08	60	B-41
"	7 NWR 27-30	RW	6.0	0.6	0.25	LHA	R.T.	0.08	360	B-42
"	7 NWR 27-31	RW	6.0	0.6	1.0	STW	R.T.	0.3	60	B-43
"	7 NWR 27-35	RW	6.0	0.6	1.0	FCS	R.T.	0.08	60	B-44
"	7 NWR 27-43	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	B-45
"	7 NWR 27-45	RW	7.4	0.486	1.0	STW	150	0.08	60	B-46
"	7 NWR 27-46	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-47
"	7 NWR 27-47	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	B-48
"	7 NWR 27-48	RW	7.4	0.486	1.0	LHA	R.T.	0.08	3800	B-49
"	7 NWR 27-50	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-50
"	7 NWR 36-10	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-51
"	7 NWR 36-11	WR	6.0	0.6	1.0	LHA	265	0.08	360	B-52
2124-T851	12 NWR 35-41	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-53
"	12 NWR 35-42	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	B-54
"	12 NWR 35-45	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-55
"	12 NWR 35-46	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	B-56
"	12 NWR 35-48	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-57
"	12 NWR 35-73	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-58
"	12 NWR 35-74	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-59
2219-T851	13 NWR 37-12	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-60
"	13 NWR 37-13	RW	7.4	0.486	1.0	LHA	265	0.08	360	B-61
"	13 NWR 37-14	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-62
"	13 NWR 37-15	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-63
2124-T851	14 NWR 41-12	RW	4.94	0.486	1.0	LHA	R.T.	0.08	360	B-64
"	14 NWR 41-13	RW	4.94	0.486	1.0	STW	R.T.	0.08	60	B-65
7075-T7651	15 NWR 42-15	RW	4.94	0.486	0.6	LHA	R.T.	0.08	360	B-66

NOTE: All figures on this page are for CT specimens.

APPENDIX INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"w"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
2219-T8511	16 NRW 48-1	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-67
" "	16 NRW 48-2	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	B-68
" "	16 NRW 48-3	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	B-69
" "	16 NRW 48-4	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	B-70
" "	16 NRW 48-5	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-71
7075-T7651	16 NRW 51-1	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	B-72
" "	18 NRW 51-2	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-73
" "	18 NRW 51-3	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-74
" "	18 NRW 51-4	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	B-75
" "	18 NRW 51-5	RW	7.4	0.486	1.0	STW	R.T.	0.08	6	B-76
" "	18 NRW 51-6	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	B-77
" "	18 NRW 51-7	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-78
" "	18 NRW 51-8	RW	7.4	0.486	1.0	SCS	R.T.	0.08	60	B-79
" "	18 NRW 51-9	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	B-80
" "	18 NRW 51-10	RW	7.4	0.486	1.0	LHA	265	0.08	360	B-81
" "	18 NRW 51-12	RW	7.4	0.486	1.0	LHA	265	0.08	60	B-82
" "	18 NRW 51-13	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-83
" "	18 NRW 51-14	RW	7.4	0.486	0.25	LHA	R.T.	0.08	360	B-84
" "	18 NRW 51-15	WR	7.4	0.486	1.0	SCS	R.T.	0.08	60	B-85
" "	18 NRW 51-16	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-86
" "	18 NRW 51-17	WR	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-87
" "	18 NRW 51-60	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	B-88
" "	18 NRW 51-61	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-89
" "	18 NRW 51-62	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-90
" "	18 NRW 51-63	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-91
" "	18 NRW 51-64	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-92
2024-T852	19 NRW 64-13	RW	6.18	0.486	1.0	LHA	R.T.	0.08	360	B-93
" "	19 NRW 64-14	RW	6.18	0.486	1.0	LHA	R.T.	0.08	60	B-94
" "	19 NRW 64-15	RW	6.18	0.486	1.0	STW	R.T.	0.08	60	B-95
" "	19 NRW 64-16	RW	6.18	0.486	1.0	LHA	R.T.	0.08	360	B-96
" "	19 NRW 64-17	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-97
2219-T852	20 NRW 65-1	RW	6.18	0.486	1.0	LHA	R.T.	0.08	360	B-98
7175-T736	21 NRW 67-1	RW	2.81	0.6	0.5	LHA	R.T.	0.08	360	B-99

NOTE: All figures on this page are for CT specimens.

APPENDIX B: INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
7075-T7352	22 NRW 68-1	RW	2.81	0.6	0.5	LHA	R.T.	0.08	360	B-100
"	22 NRW 68-12	RW	3.0	0.6	0.5	LHA	R.T.	0.08	360	B-101
7050-T73	23 NRW 69-1	RW	2.81	0.6	0.5	LHA	R.T.	0.08	360	B-102
7049-T73 (Zr modified)	24 NRW 70-1	RW	2.81	0.6	0.5	LHA	R.T.	0.08	360	B-103
7049-T7352	25 NRW 71-1	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	B-104
"	25 NRW 71-2	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	B-105
"	25 NRW 71-3	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-106
"	25 NRW 71-4	RW	7.4	0.486	1.0	STW	R.T.	0.08	6	B-107
"	25 NRW 71-5	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	B-108
"	25 NRW 71-6	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-109
"	25 NRW 71-7	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-110
"	25 NRW 71-9	RW	7.4	0.486	0.25	LHA	R.T.	0.08	360	B-111
"	25 NRW 71-10	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-112
"	25 NWR 71-11	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-113
"	25 NWR 71-12	WR	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-114
"	25 NRW 71-43	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	B-115
"	25 NWR 71-44	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-116
7175-T7362	26 NRW 72-27	RW	7.4	0.486	1.0	LHA	R.T.	0.08	6	B-117
"	26 NRW 72-28	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	B-118
"	26 NRW 72-29	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-119
"	26 NRW 72-30	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-120
"	26 NRW 72-31	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	B-121
"	26 NRW 72-32	RW	7.4	0.486	1.0	LHA	265	0.08	360	B-122
"	26 NRW 72-33	RW	7.4	0.486	1.0	STW	R.T.	0.08	6	B-123
"	26 NRW 72-34	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-124
"	26 NRW 72-35	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	B-125
"	26 NRW 72-36	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	B-126
"	26 NRW 72-37	RW	7.4	0.486	1.0	SCS	R.T.	0.08	60	B-127
"	26 NRW 72-38	RW	7.4	0.486	1.0	FCS	R.T.	0.08	60	B-128
"	26 NRW 72-40	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-129
"	26 NRW 72-41	RW	7.4	0.486	0.25	LHA	R.T.	0.08	360	B-130
"	26 NWR 72-44	WR	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-131
"	26 NWR 72-45	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-132
"	26 NWR 72-46	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-133

NOTE: All figures on this page are for CT specimens.

APPENDIX B: INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
2024-T652	27 NRW 75-1	RW	7.4	0.486	1.0	LHA	R.T.	0.08	6	B-134
"	27 NRW 75-2	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	B-135
"	27 NRW 75-3	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-136
"	27 NRW 75-4	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-137
"	27 NRW 75-5	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	B-138
"	27 NRW 75-6	RW	7.4	0.486	1.0	JP4	R.T.	0.08	60	B-139
"	27 NRW 75-7	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-140
"	27 NRW 75-8	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-141
"	27 NRW 75-9	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	B-142
"	27 NRW 75-10	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	B-143
"	27 NRW 75-11	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-144
"	27 NRW 75-12	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-145
"	27 NRW 75-13	RW	7.4	0.486	0.25	LHA	R.T.	0.08	360	B-146
"	27 NRW 75-14	RW	7.4	0.486	1.0	STW	150	0.08	60	B-147
"	27 NRW 75-15	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	B-148
2024-T652	27 NRW 75-16	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-149
"	27 NRW 75-17	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	B-150
"	27 NRW 75-51	RW	7.4	0.486	1.0	STW	150	0.08	60	B-151
"	27 NRW 75-52	RW	7.4	0.486	1.0	SCS	R.T.	0.08	60	B-152
"	27 NRW 75-53	RW	7.4	0.486	1.0	LHA	R.T.	0.7	360	B-153
"	27 NRW 75-54	RW	7.4	0.486	1.0	LHA	265	0.08	360	B-154
"	27 NRW 75-55	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-155
"	27 NRW 75-56	WR	7.4	0.486	1.0	STW	R.T.	0.08	6	B-156
"	27 NRW 75-57	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-157
"	27 NRW 75-58	WR	7.4	0.486	1.0	LHA	265	0.08	360	B-158
"	27 NRW 75-59	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-159
7050-T73651	28 NRW 80-22	RW	6.0	0.6	1.0	LHA	R.T.	0.5	360	B-160
"	28 NRW 80-23	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-161
"	28 NRW 80-24	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	B-162
"	28 NRW 80-25	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	B-163
"	28 NRW 80-26	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-164

NOTE: All figures on this page are for CT specimens.

APPENDIX B: INDEX OF FIGURES

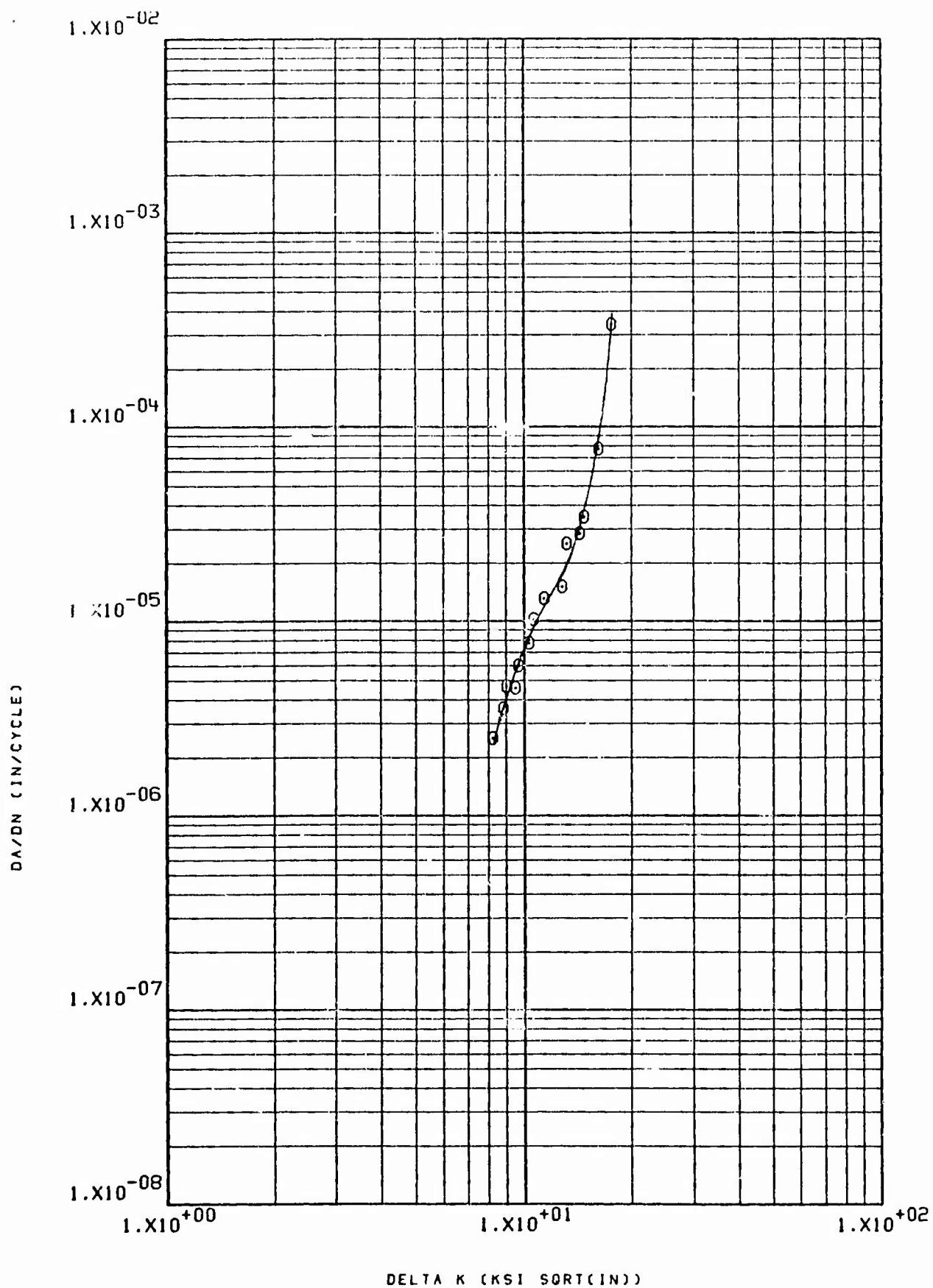
Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environ-ment	Test Temp	"R"	Freq (CPM)	Page No.
7075-T73511	29 NRW 83-1	RW	7.4	0.486	1.0	LHA	R.T.	0.08	6	B-165
"	29 NRW 83-2	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	B-166
"	29 NRW 83-3	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-167
"	29 NRW 83-4	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-168
"	29 NRW 83-5	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	B-169
"	29 NRW 83-6	RW	7.4	0.486	1.0	LHA	265	0.08	360	B-170
"	29 NRW 83-7	RW	7.4	0.486	1.0	STW	R.T.	0.08	6	B-171
"	29 NRW 83-8	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-172
"	29 NRW 83-9	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	B-173
"	29 NRW 83-10	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	B-174
"	29 NRW 83-11	RW	7.4	0.486	1.0	SCS	R.T.	0.08	60	B-175
"	29 NRW 83-12	RW	7.4	0.486	1.0	LHA	R.T.	0.7	360	B-176
"	29 NRW 83-13	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-177
"	29 NRW 83-14	RW	7.4	0.486	0.25	LHA	R.T.	0.08	360	B-178
"	29 NRW 83-15	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-179
7075-T73511	29 NRW 83-16	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-180
"	29 NRW 83-17	WR	7.4	0.486	1.0	SCS	R.T.	0.08	360	B-181
"	29 NRW 83-18	WR	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-182
7075-T76	30 NRW 85-1	RW			0.1	LHA	R.T.	0.08	60	B-183
"	30 NRW 85-2	RW			0.1	LHA	R.T.	0.08	360	B-184
"	30 NRW 85-3	RW			0.1	LHA	R.T.	0.3	360	B-185
"	30 NRW 85-4	RW			0.1	STW	R.T.	0.08	60	B-186
"	30 NRW 85-5	RW			0.1	SCS	R.T.	0.08	60	B-187
"	30 NRW 85-7	RW			0.1	Freon TF	R.T.	0.08	60	B-188
"	30 NRW 85-12	WR			0.1	LHA	R.T.	0.08	360	B-189
7075-T76	301 NRW 86-4	RW			0.1	LHA	R.T.	0.08	360	B-190

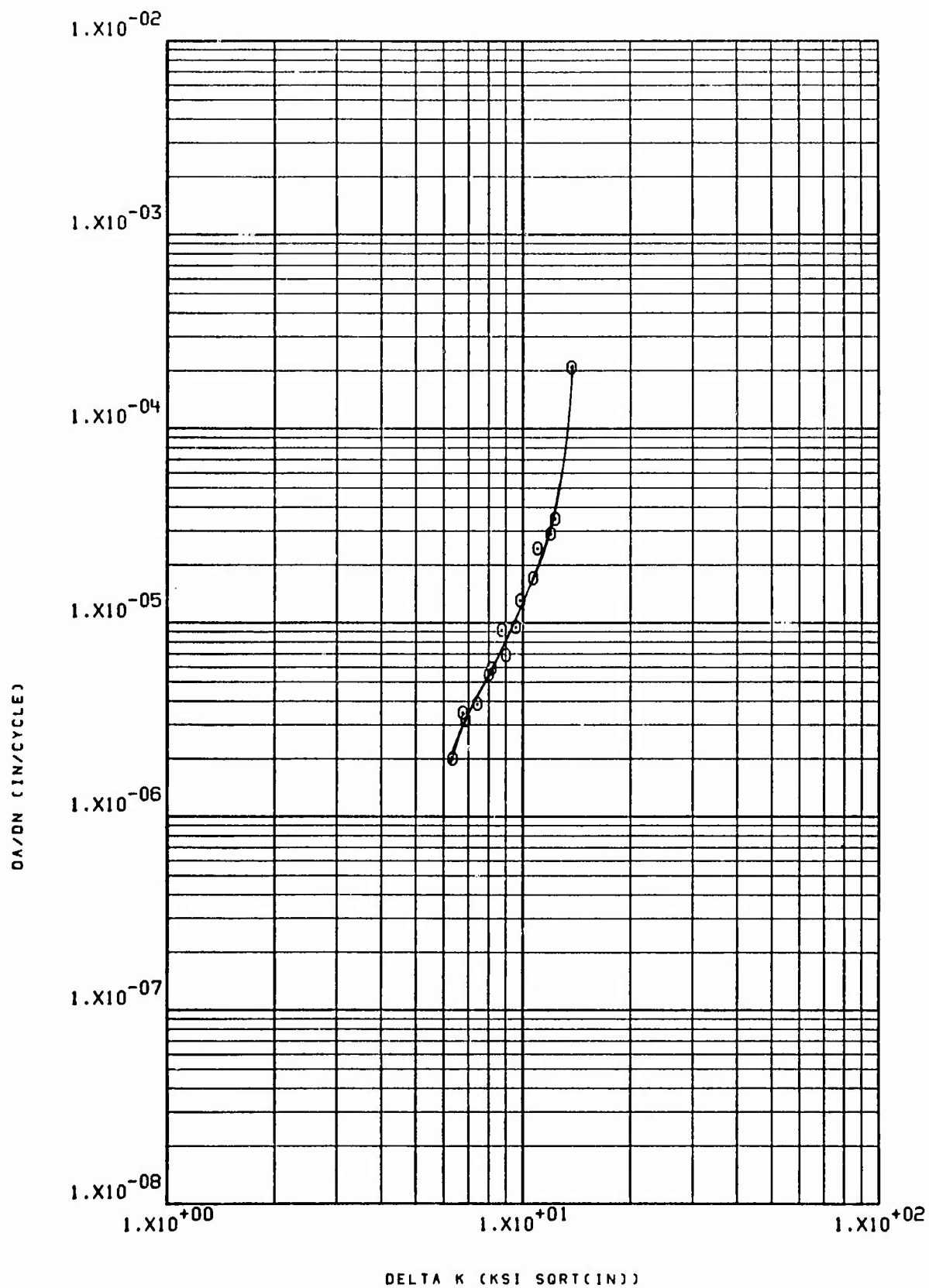
NOTE: Figures 30 NRW 85-1 through 301 NRW 86-4 are for CCT specimens. All others are for CT specimens.

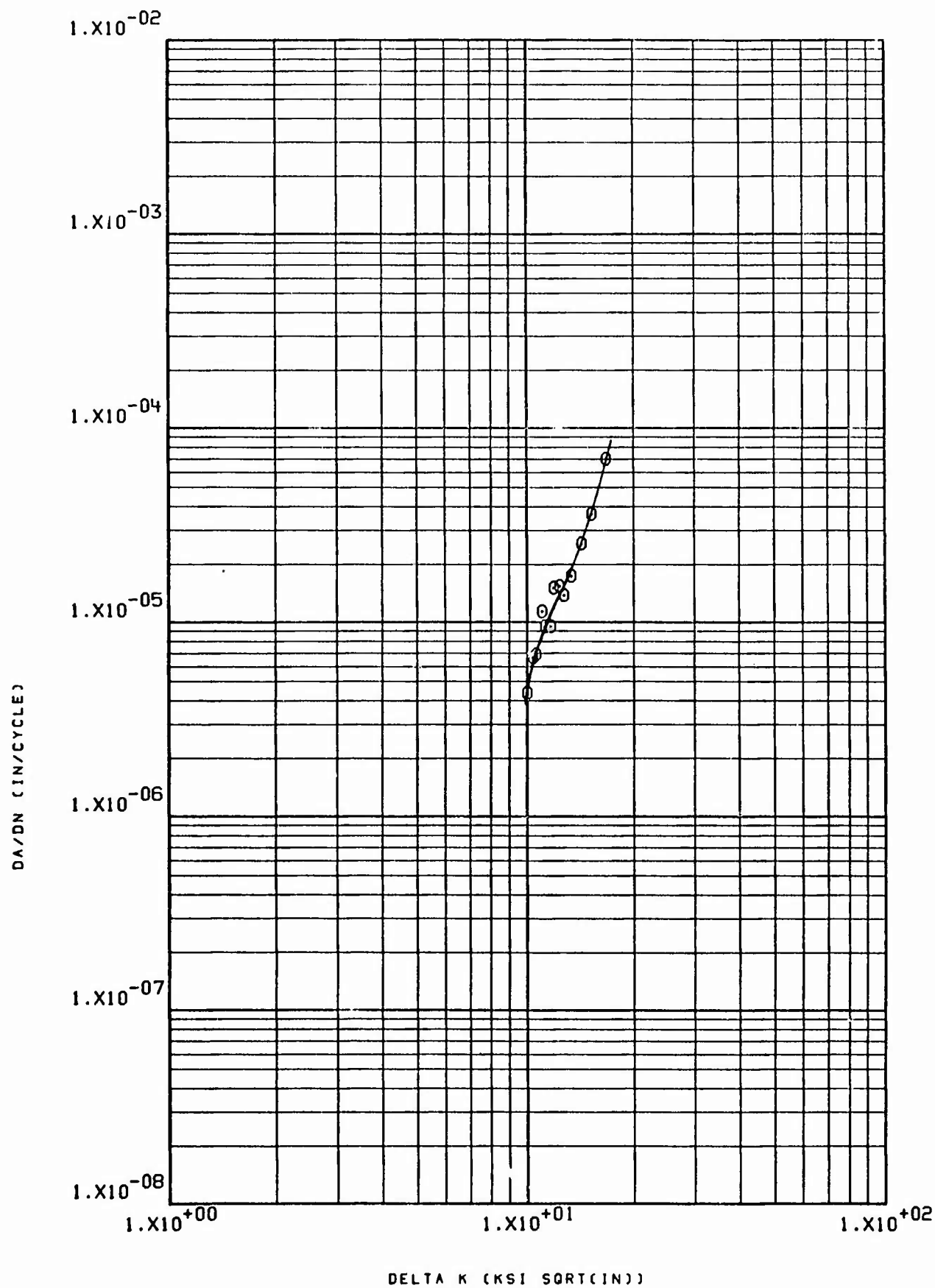
APPENDIX B: INDEX OF FIGURES

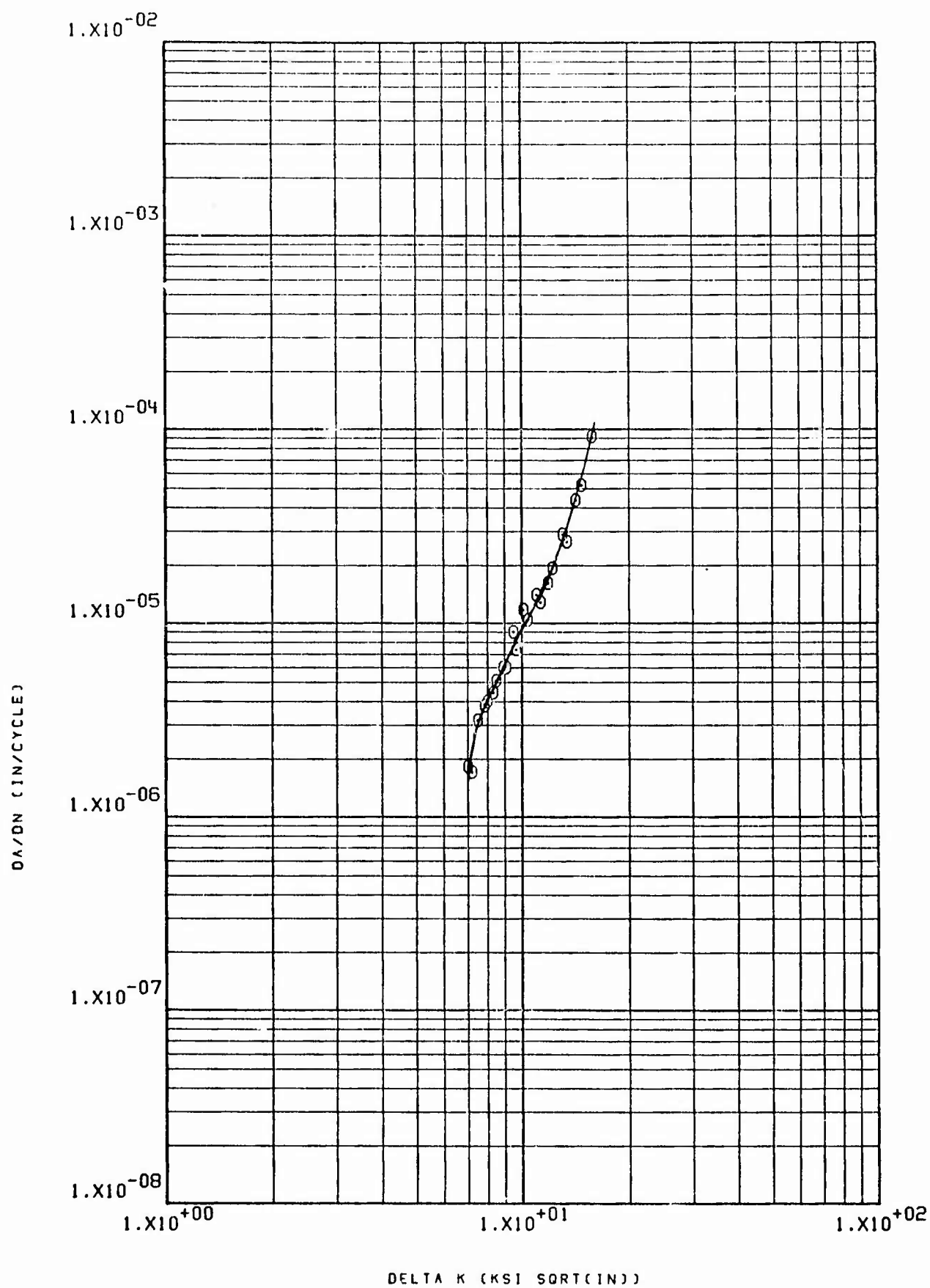
Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environ- ment	Test Temp	"R"	Freq (CPM)	Page No.
2024-T81	302 NRW 87-1	RW			0.1	LHA	R.T.	0.08	60	B-191
" "	302 NRW 87-2	RW			0.1	LHA	R.T.	0.08	360	B-192
" "	302 NRW 87-3	RW			0.1	LHA	R.T.	0.3	360	B-193
" "	302 NRW 87-4	RW			0.1	LHA	R.T.	0.5	360	B-194
" "	302 NRW 87-5	RW			0.1	JP4	R.T.	0.08	60	B-195
" "	302 NRW 87-6	RW			0.1	STW	R.T.	0.08	60	B-196
" "	302 NWR 87-13	WR			0.1	LHA	R.T.	0.08	360	B-197
" "	302 NWR 87-14	WR			0.1	STW	R.T.	0.08	60	B-198
2024-T81	303 NRW 88-1	RW			0.1	LHA	R.T.	0.08	60	B-199
" "	303 NRW 88-3	RW			0.1	LHA	R.T.	0.3	360	B-200
" "	303 NRW 88-4	RW			0.1	LHA	R.T.	0.5	360	B-201
" "	303 NRW 88-5	RW			0.1	JP4	R.T.	0.08	60	B-202
" "	303 NRW 88-6	RW			0.1	STW	R.T.	0.08	60	B-203
" "	303 NRW 88-9	RW			0.1	LHA	R.T.	0.08	360	B-204
" "	303 NWR 88-11	WR			0.1	LHA	R.T.	0.08	360	B-205
" "	303 NWR 88-14	WR			0.1	STW	R.T.	0.08	60	B-206
2219-T851	304 NRW 89-6	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-207
7075-T76511	309 NRW 96-6	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	B-208
" "	309 NRW 96-7	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	B-209
" "	309 NRW 96-8	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-210
" "	309 NWR 96-9	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-211
7075-T73511	311 NWR 100-1	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	B-212
2219-T851	314 NRW 110-1	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-213

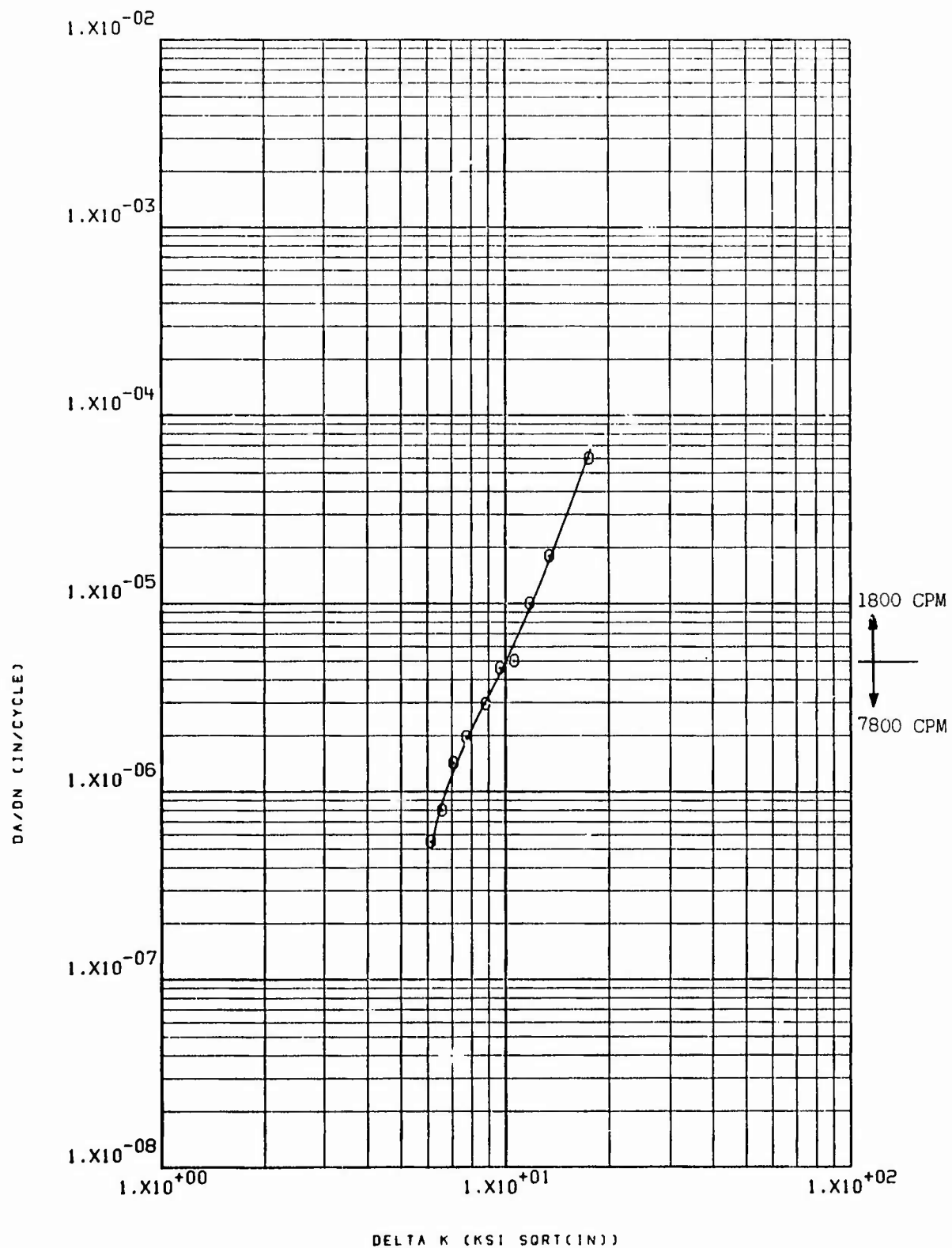
NOTE: Figures 302 NRW 87-1 through 303 NWR 88-14 are for CCT specimens. All others are for CT specimens.



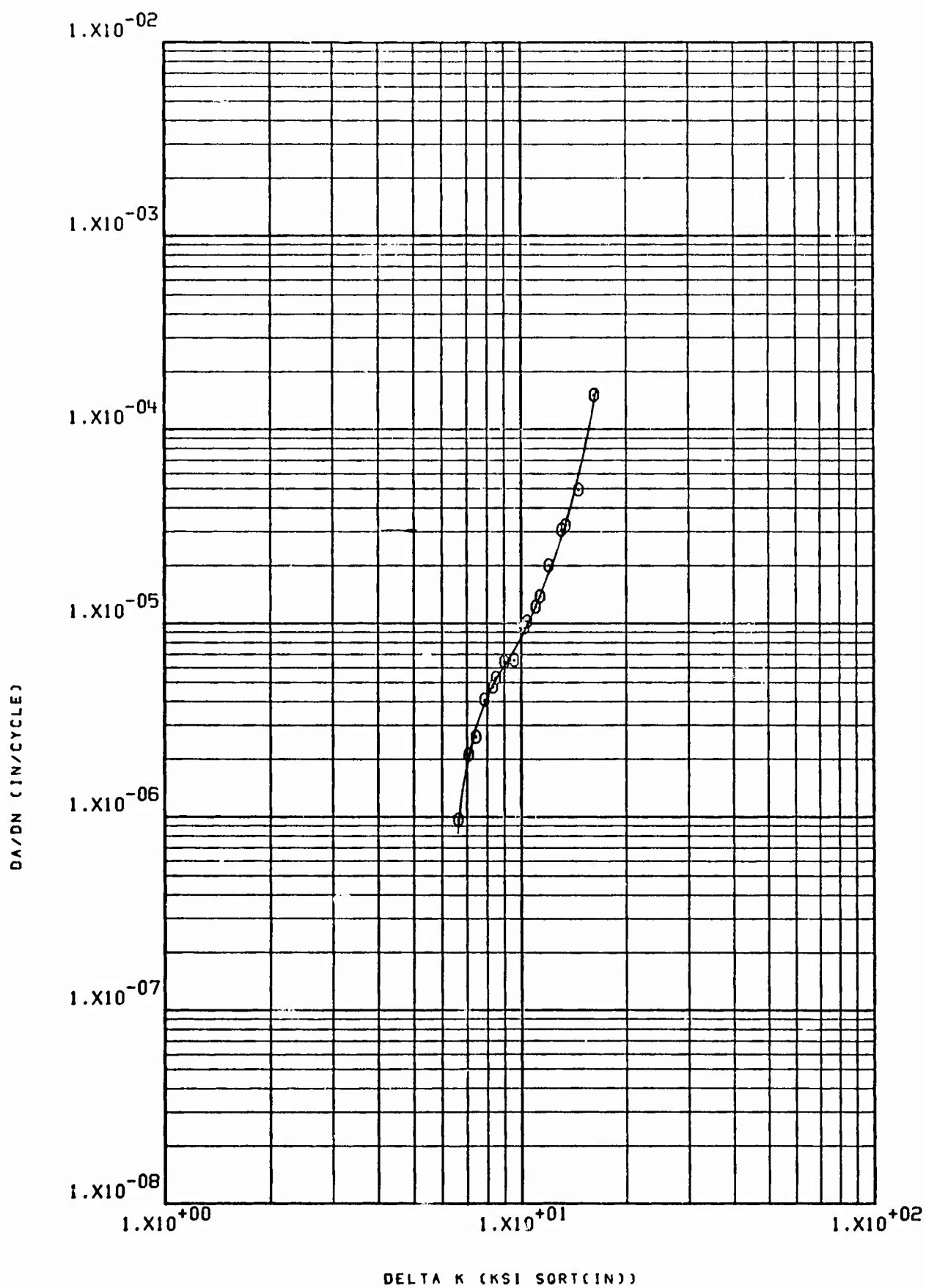


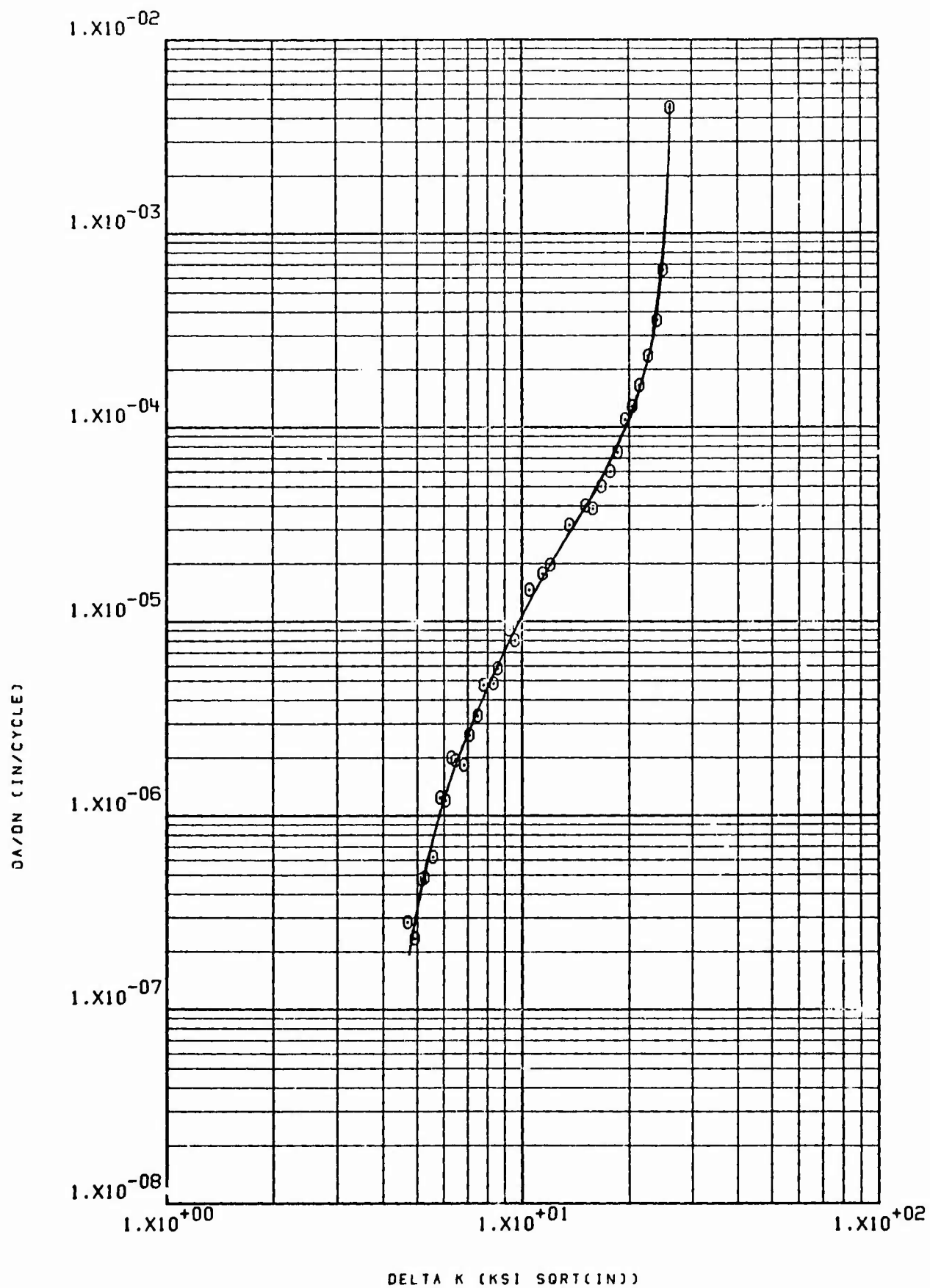


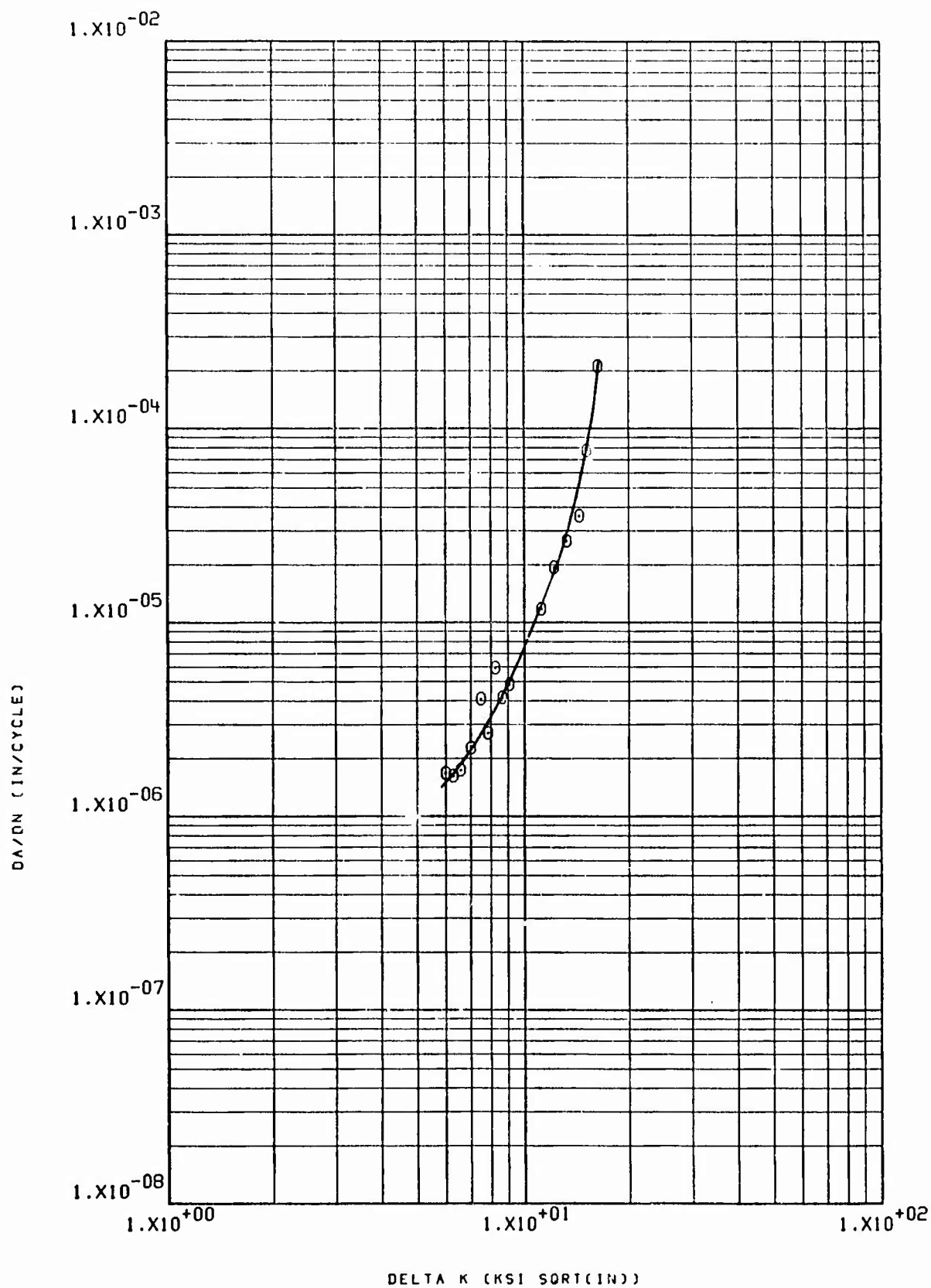




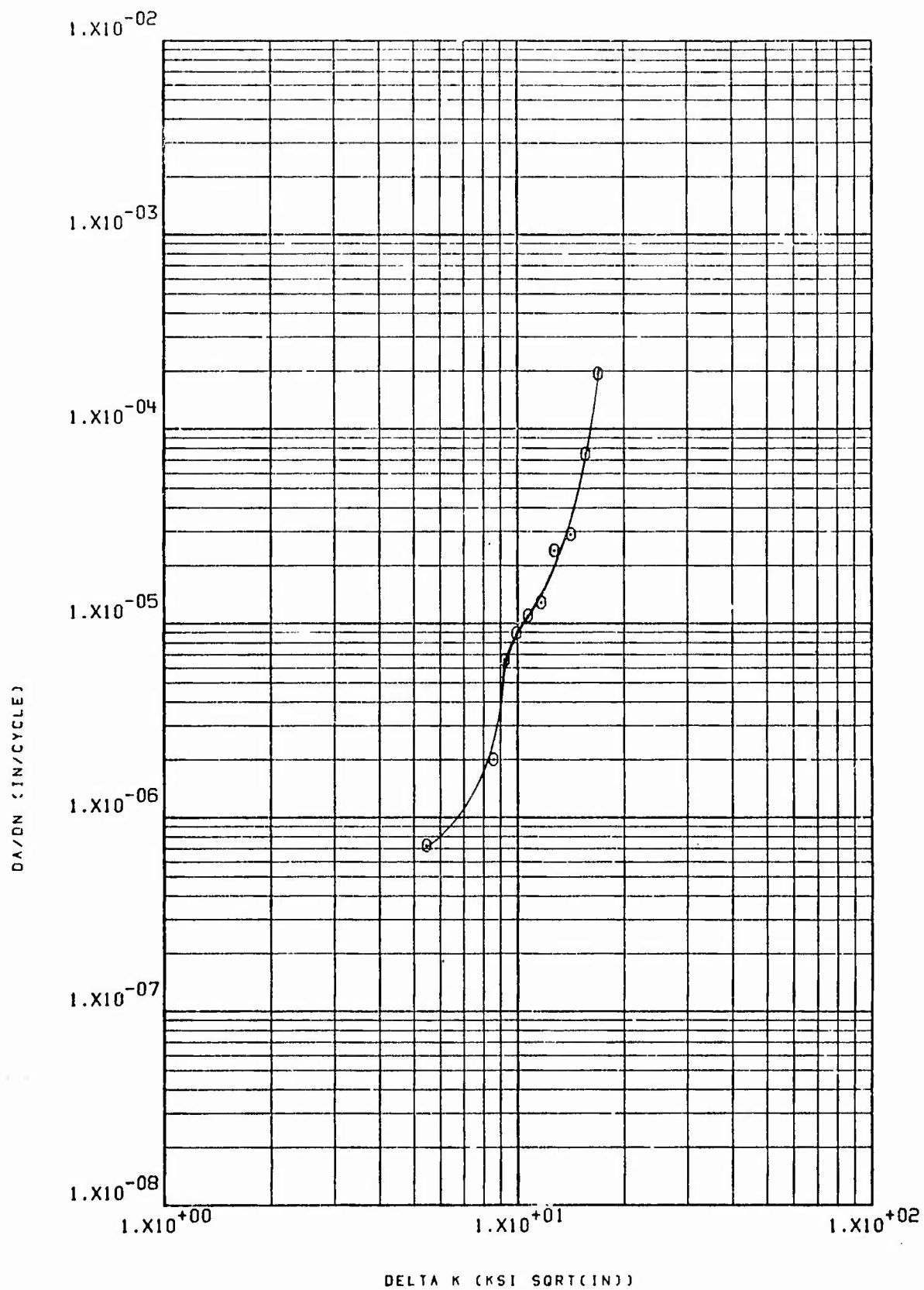
1 NRW 11 2024-T851 LA R.T. R=.05 7800 & 1800 cpm

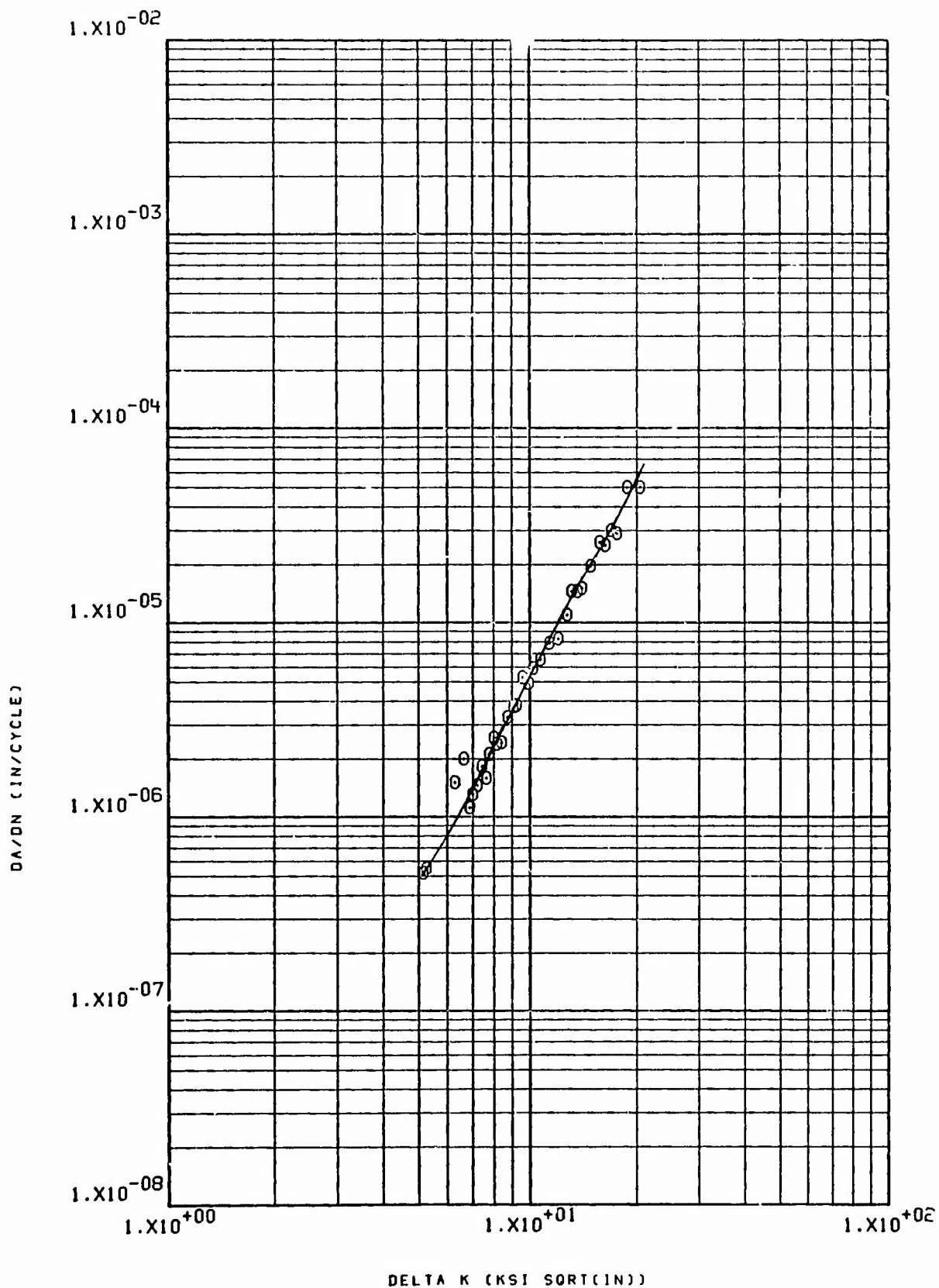


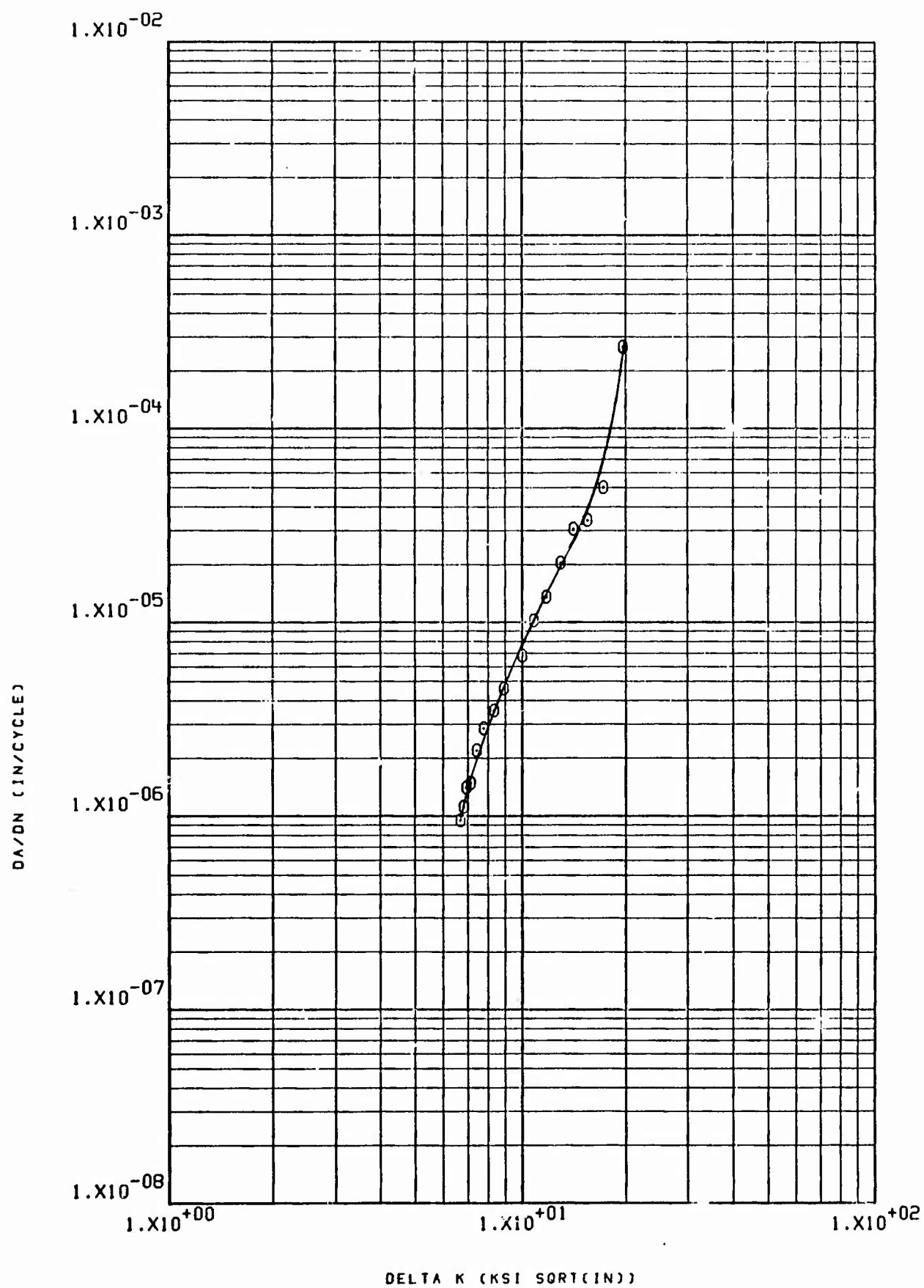


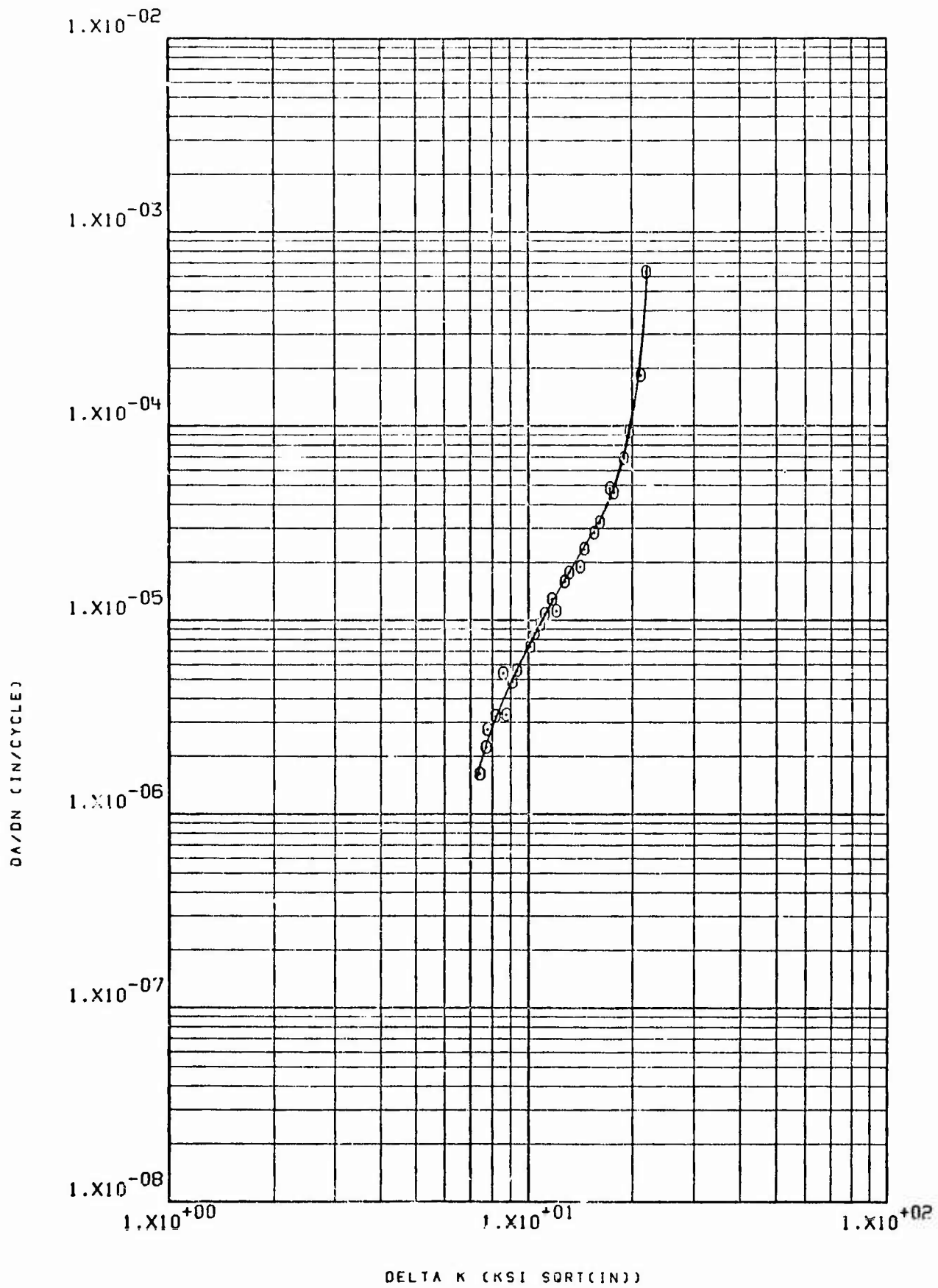


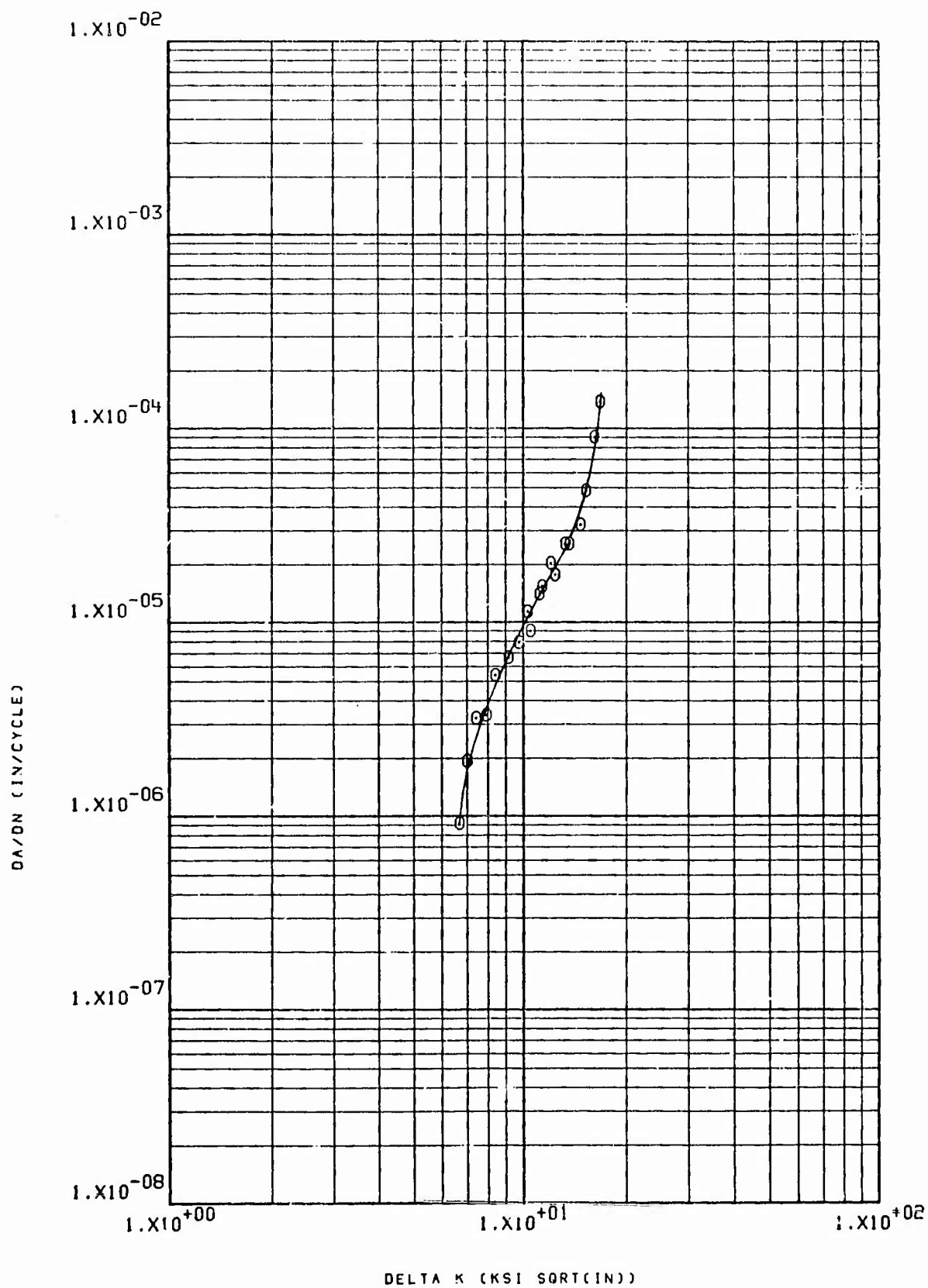
1 NRW 19 2024-1-851 R.T. DISTILLED WATER 60CPM R=.08



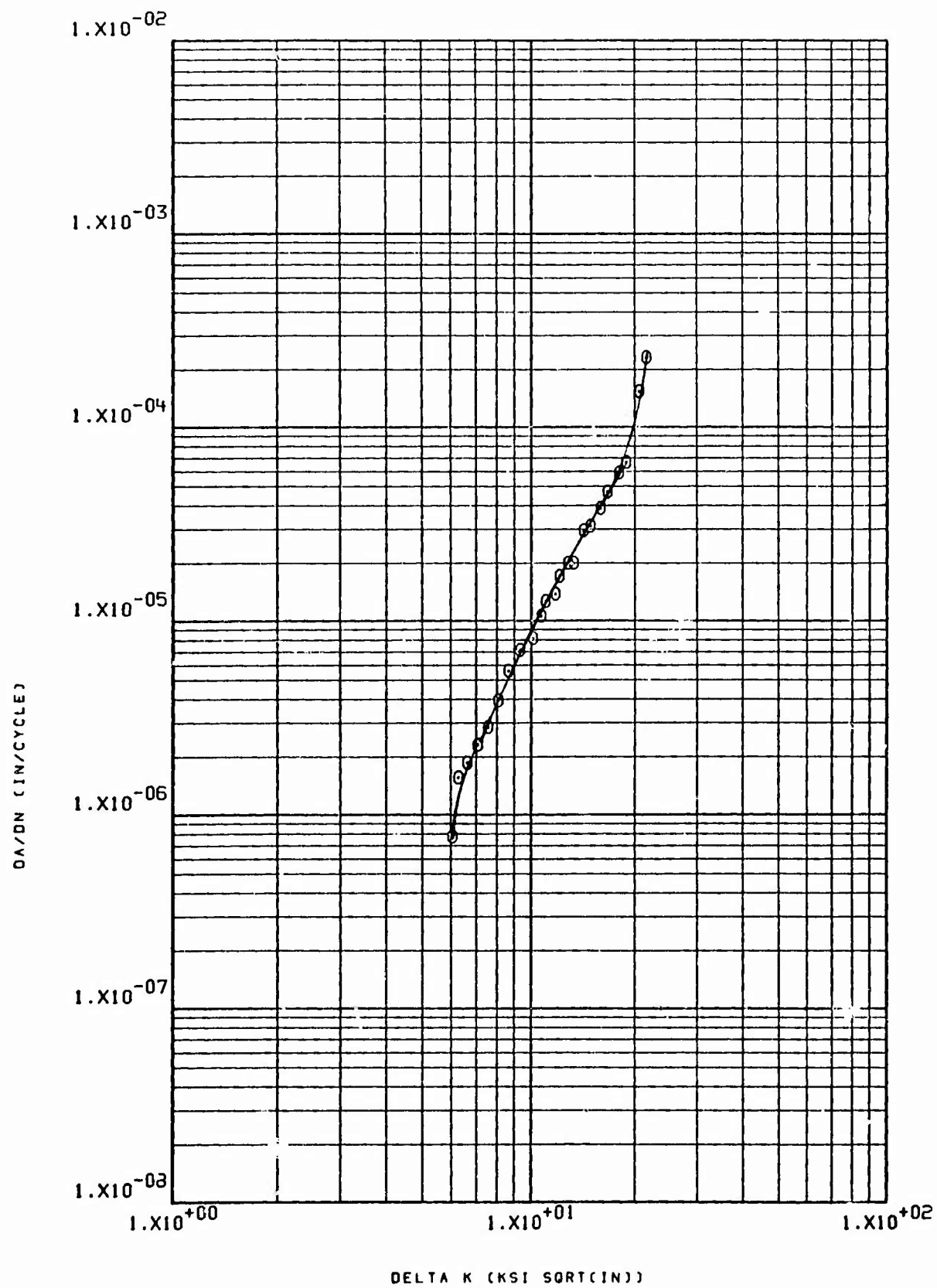






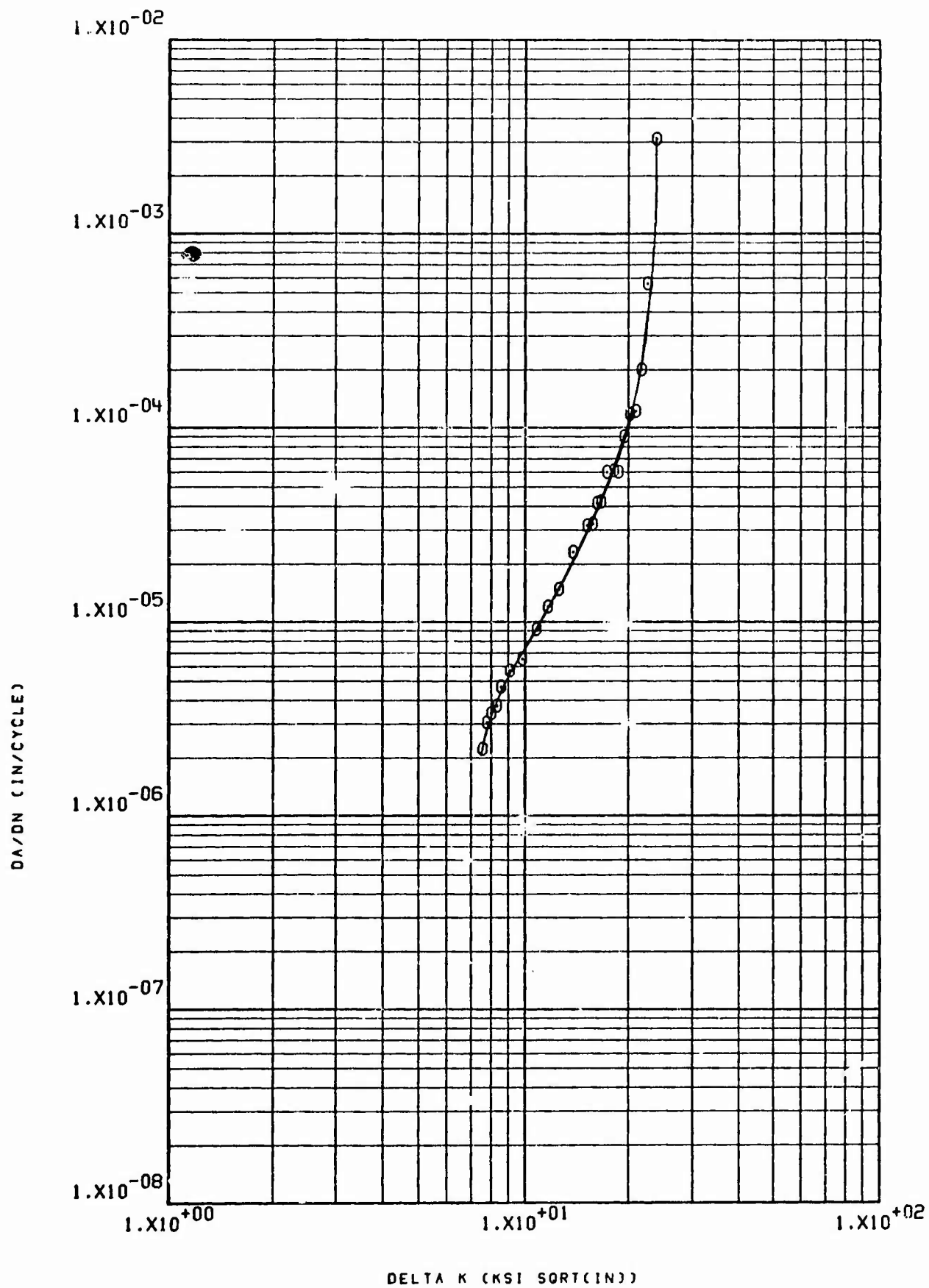


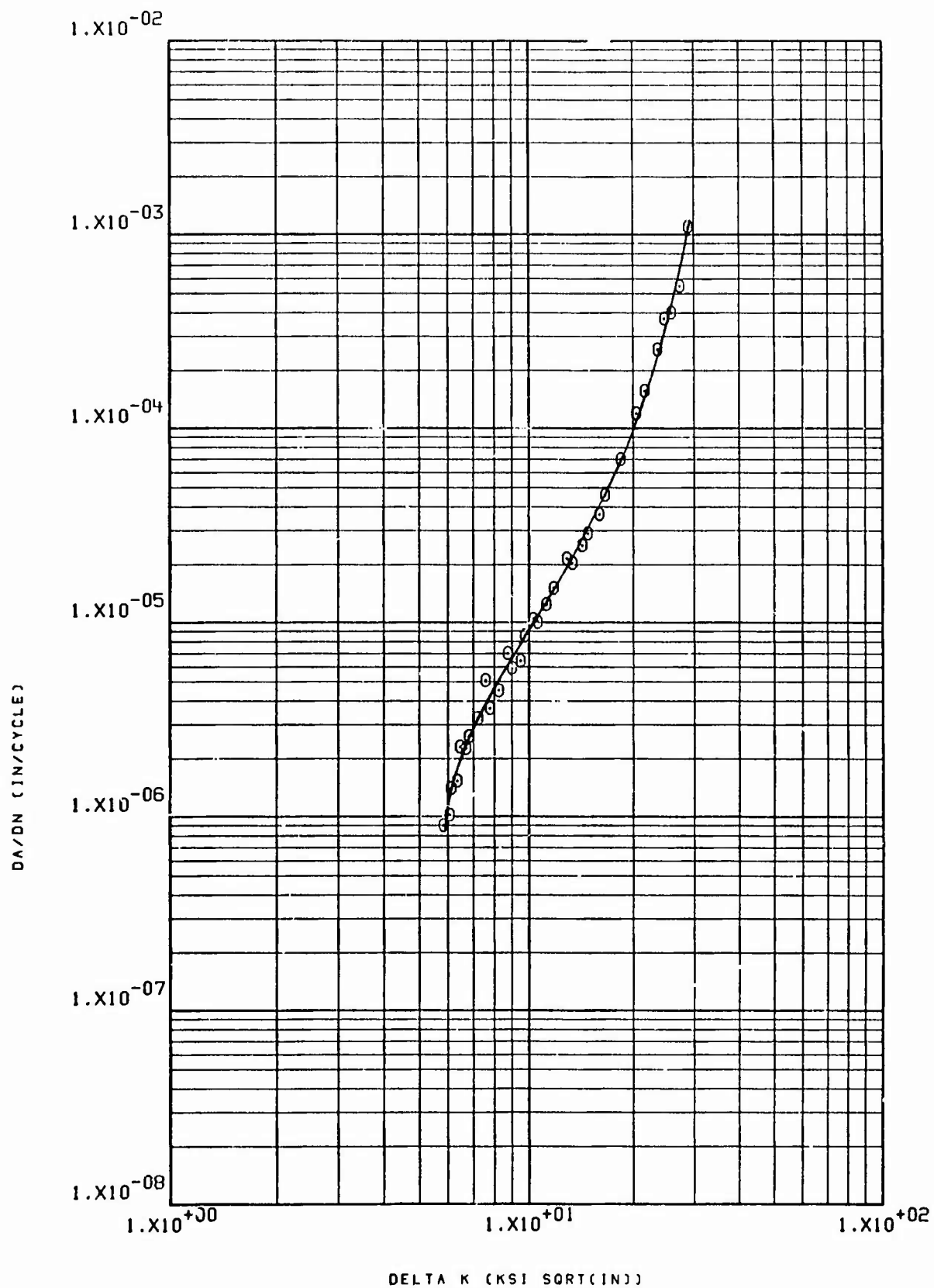
3 NWR 8-52 2024-1851 LHA RT 360CPM R=.08



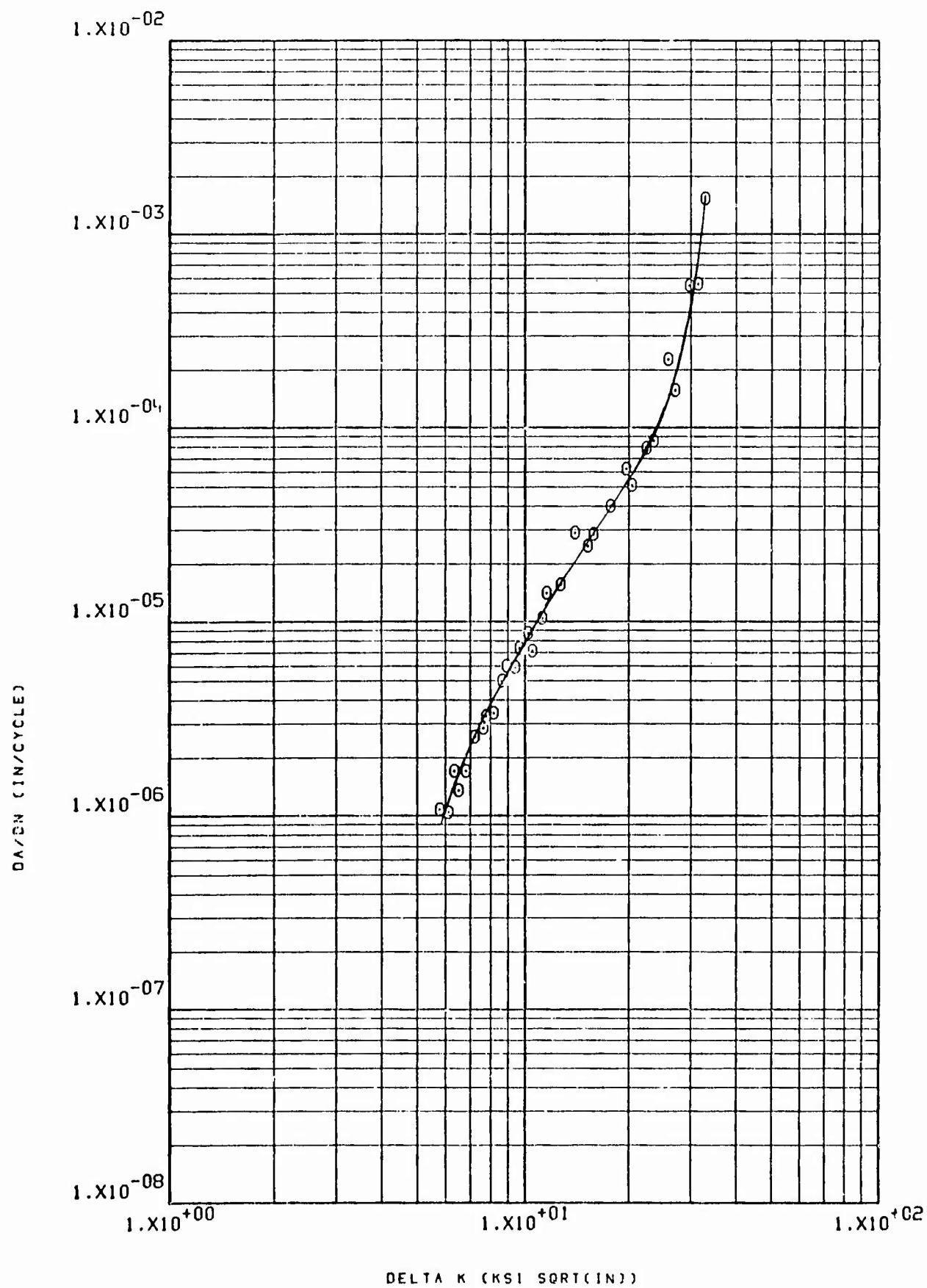
3 NRW 8-53 2024-T851 JP4 R.T. 60CPM R=.08

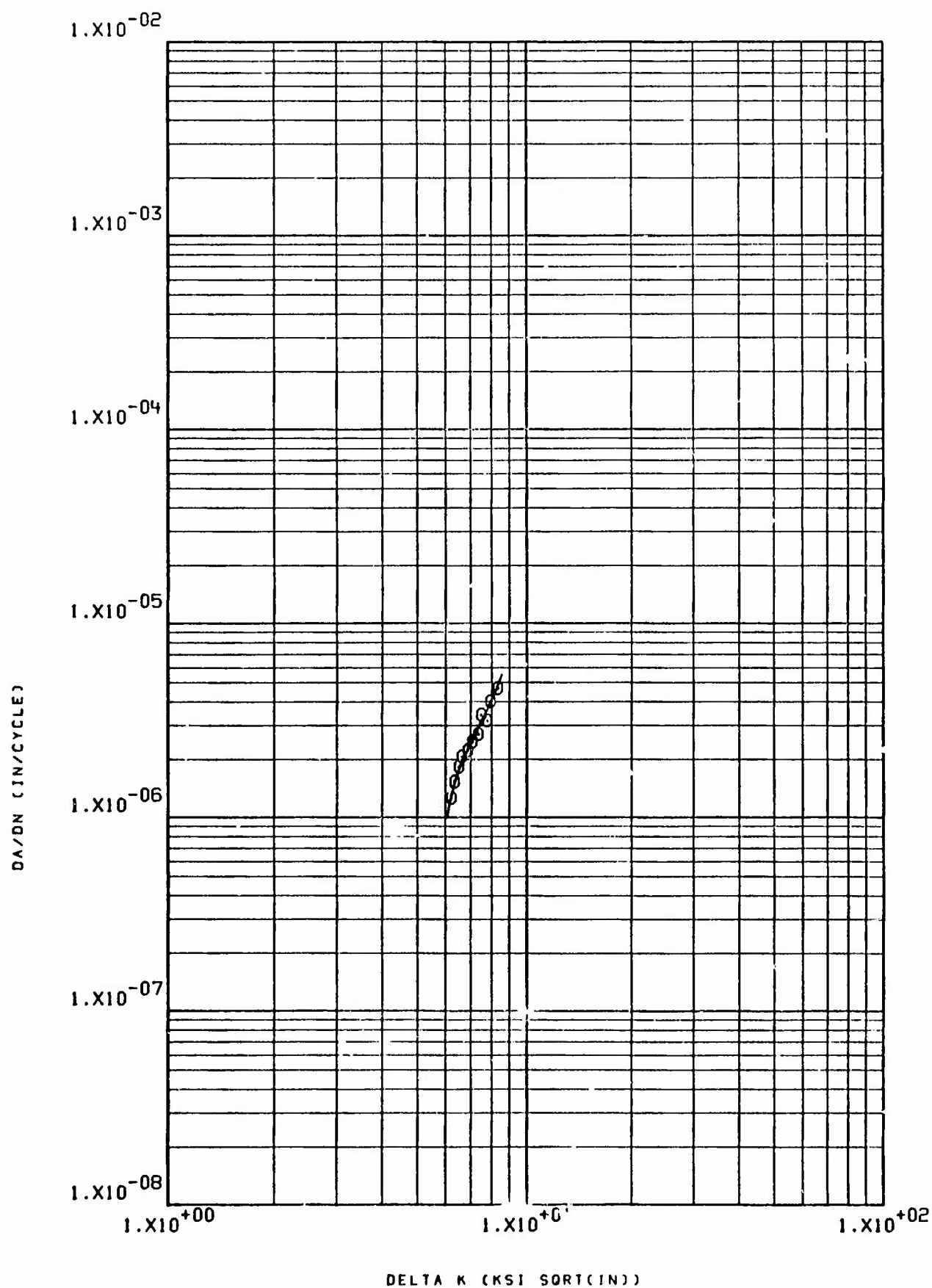
B-14

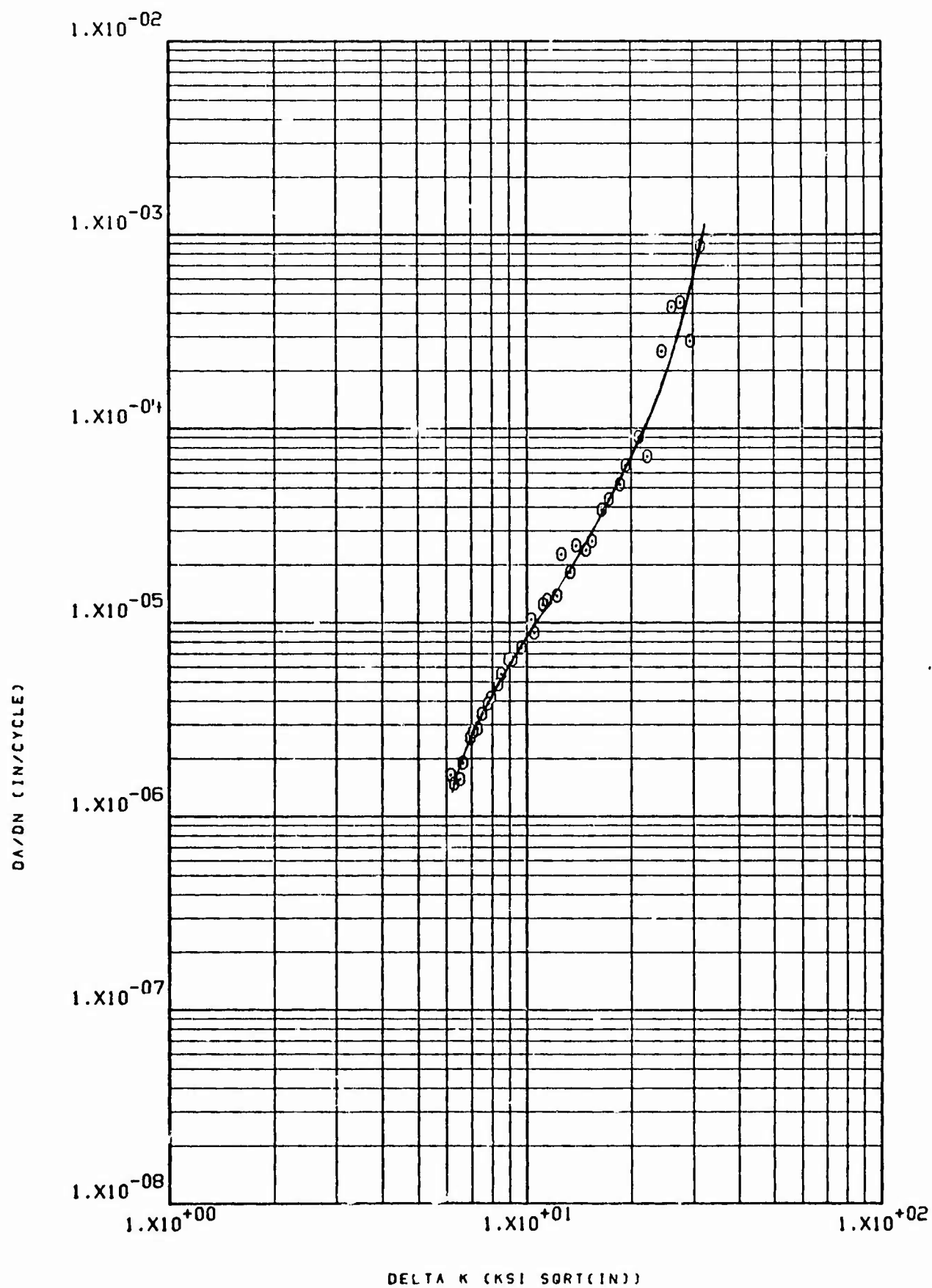




4 NWR 9-11 2219-T-851 LHA R.T. 360CPM R=.08

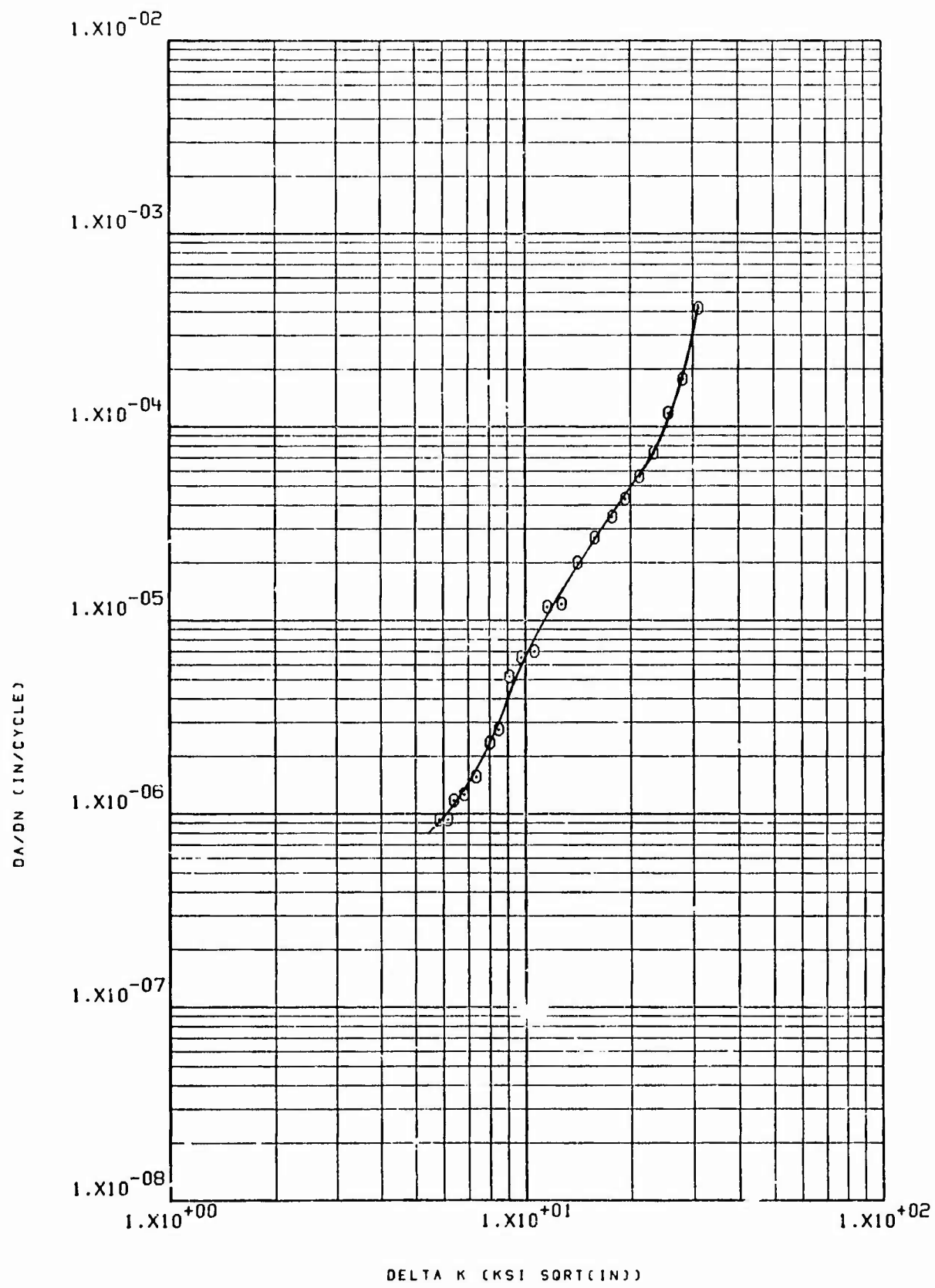


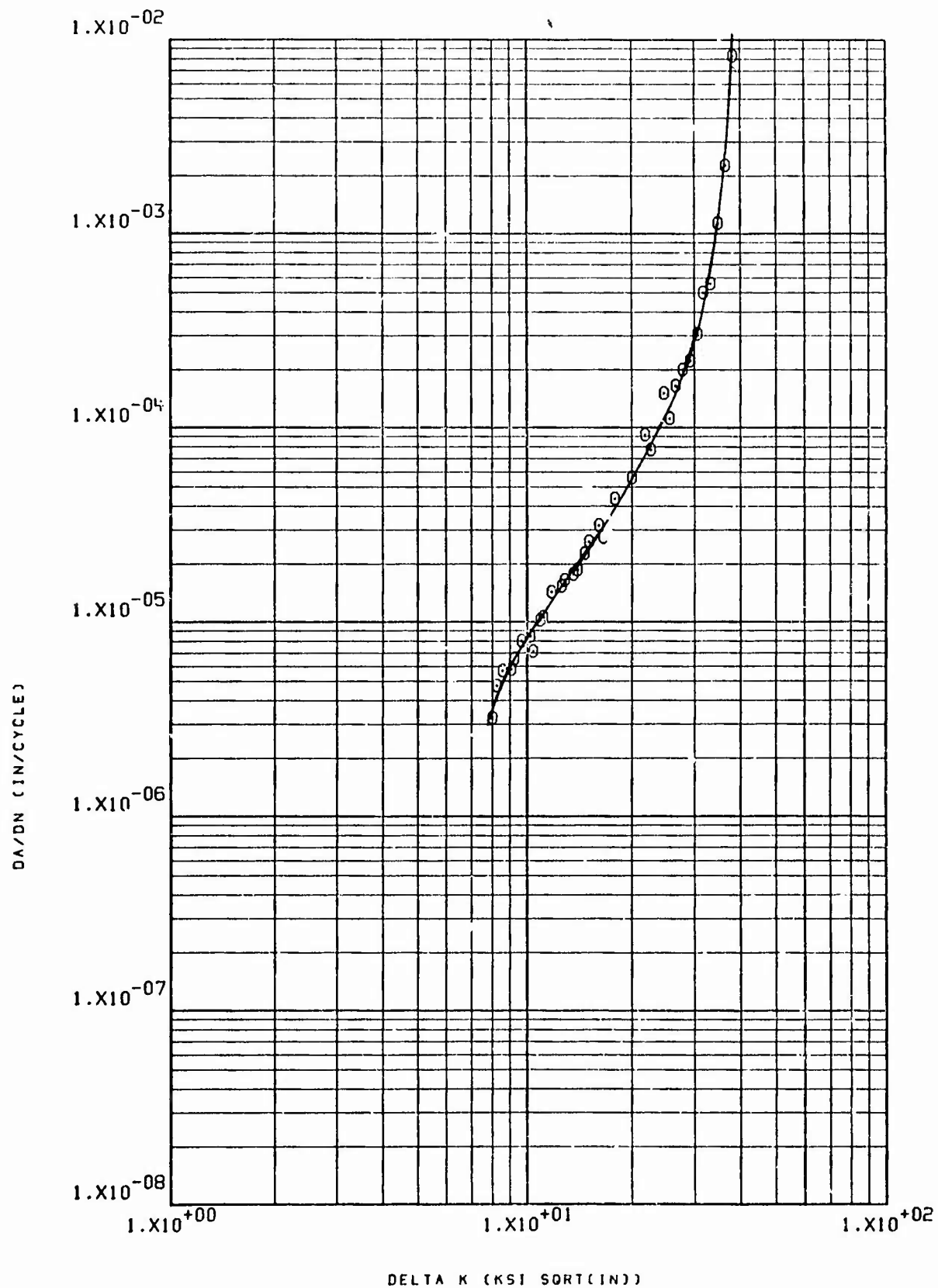




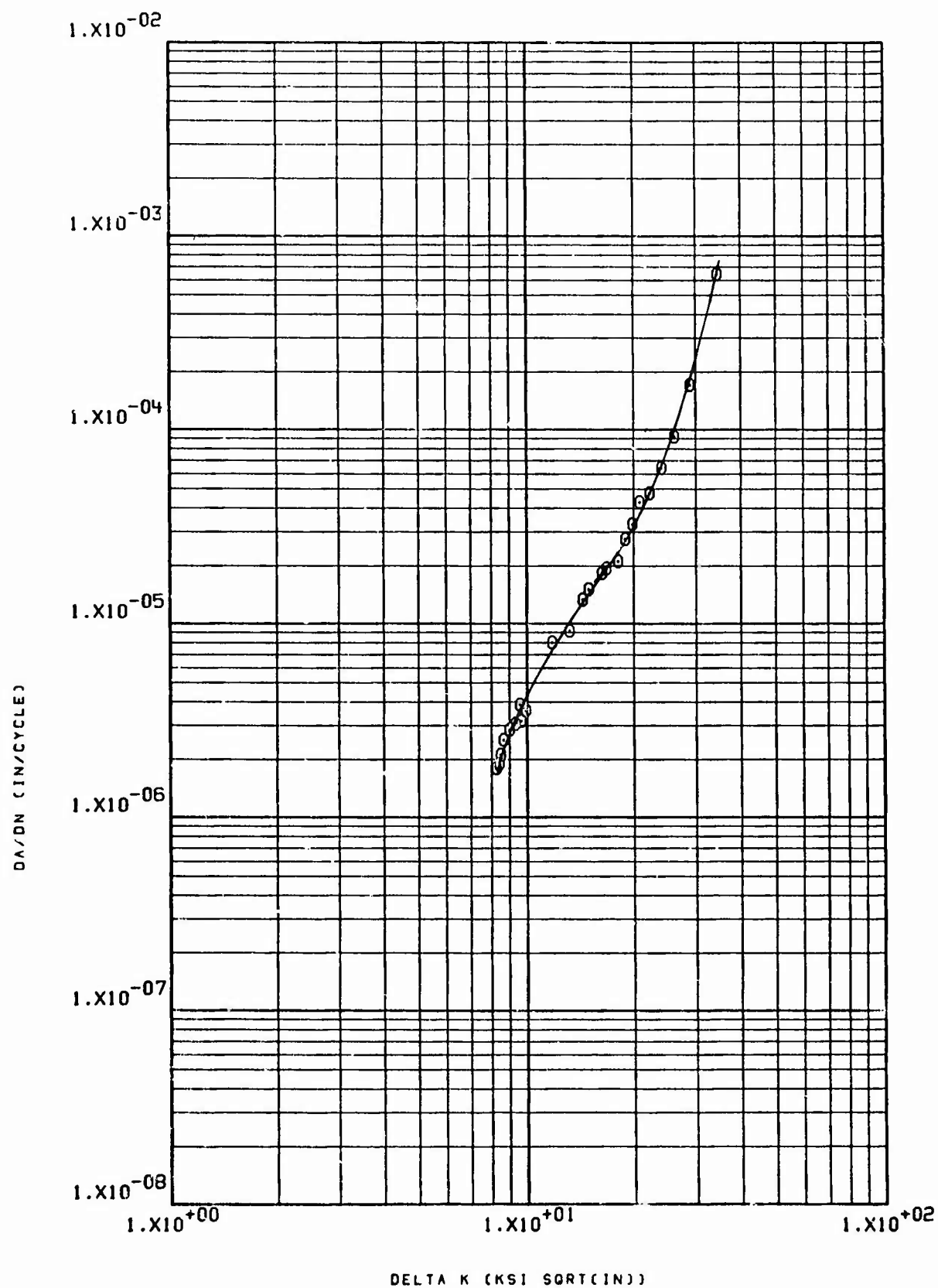
4 NRW 9-15 2219-T-851 LHA R.T. 360CPM R=.08

B-19

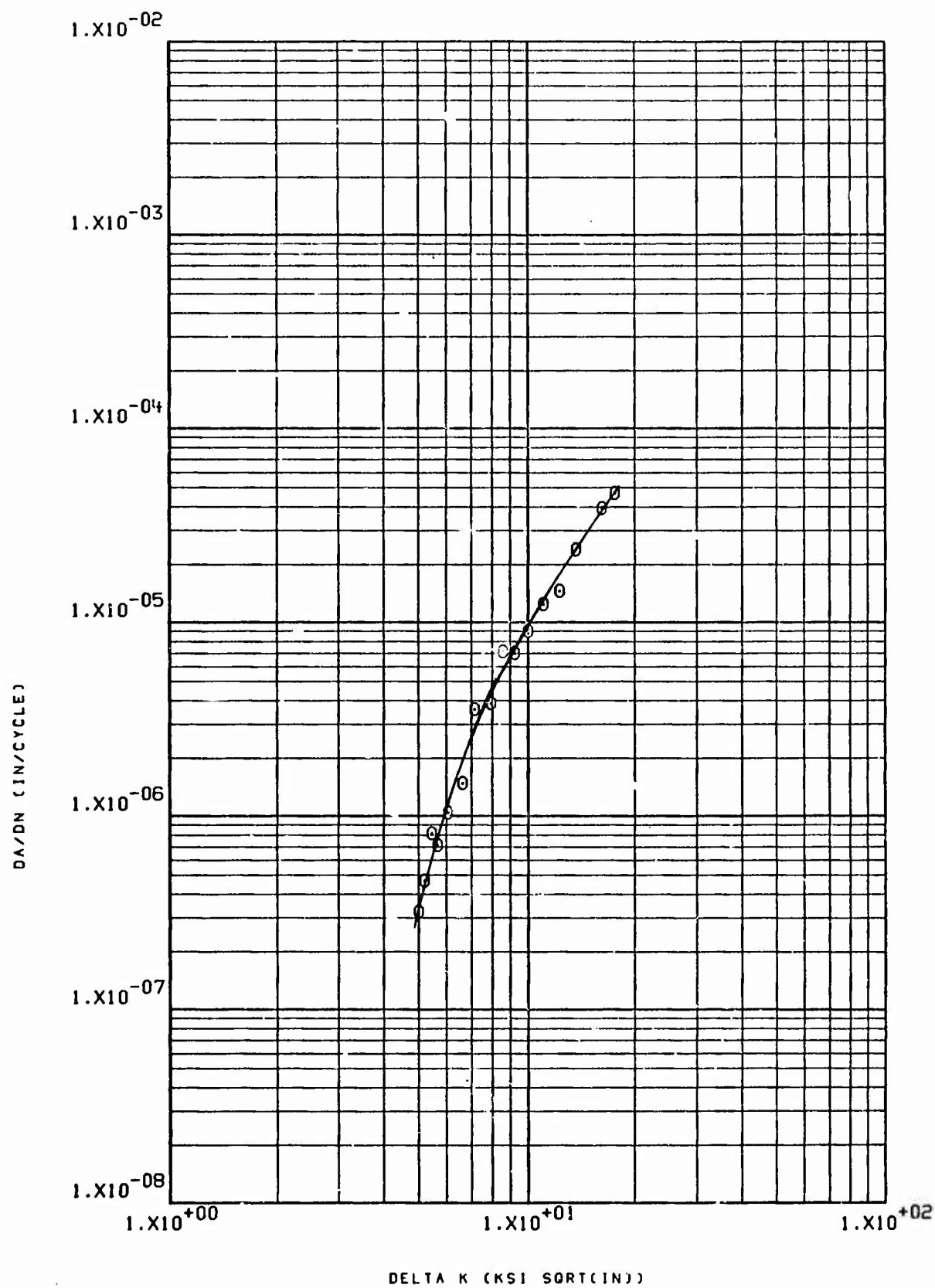




4 NRW 9-20 2219-T-851 DISTILLED WATER R.T. 60CPH R=.08



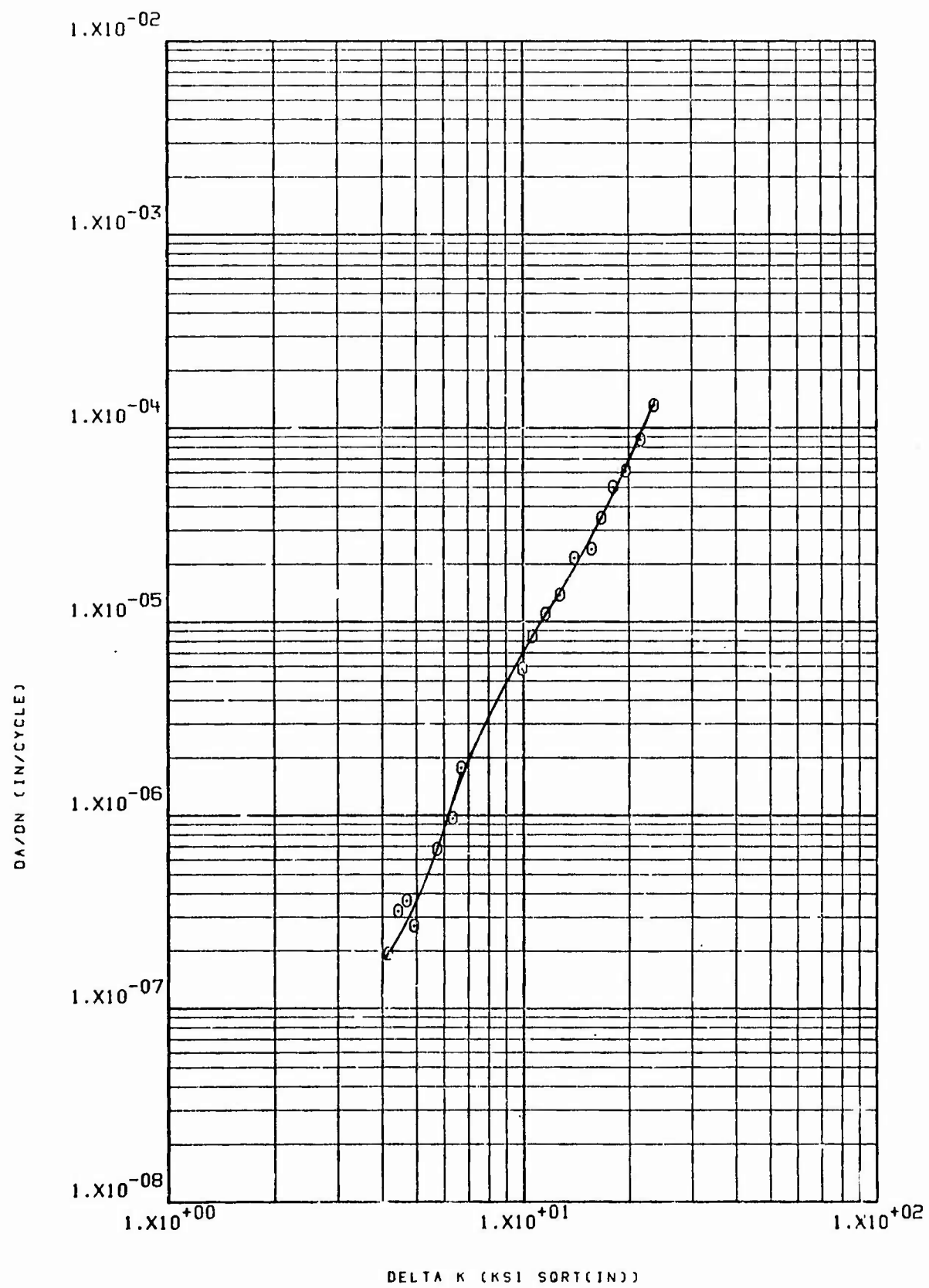
4 NRW 9-54 2219-T851 LHA RT .08 360CPM

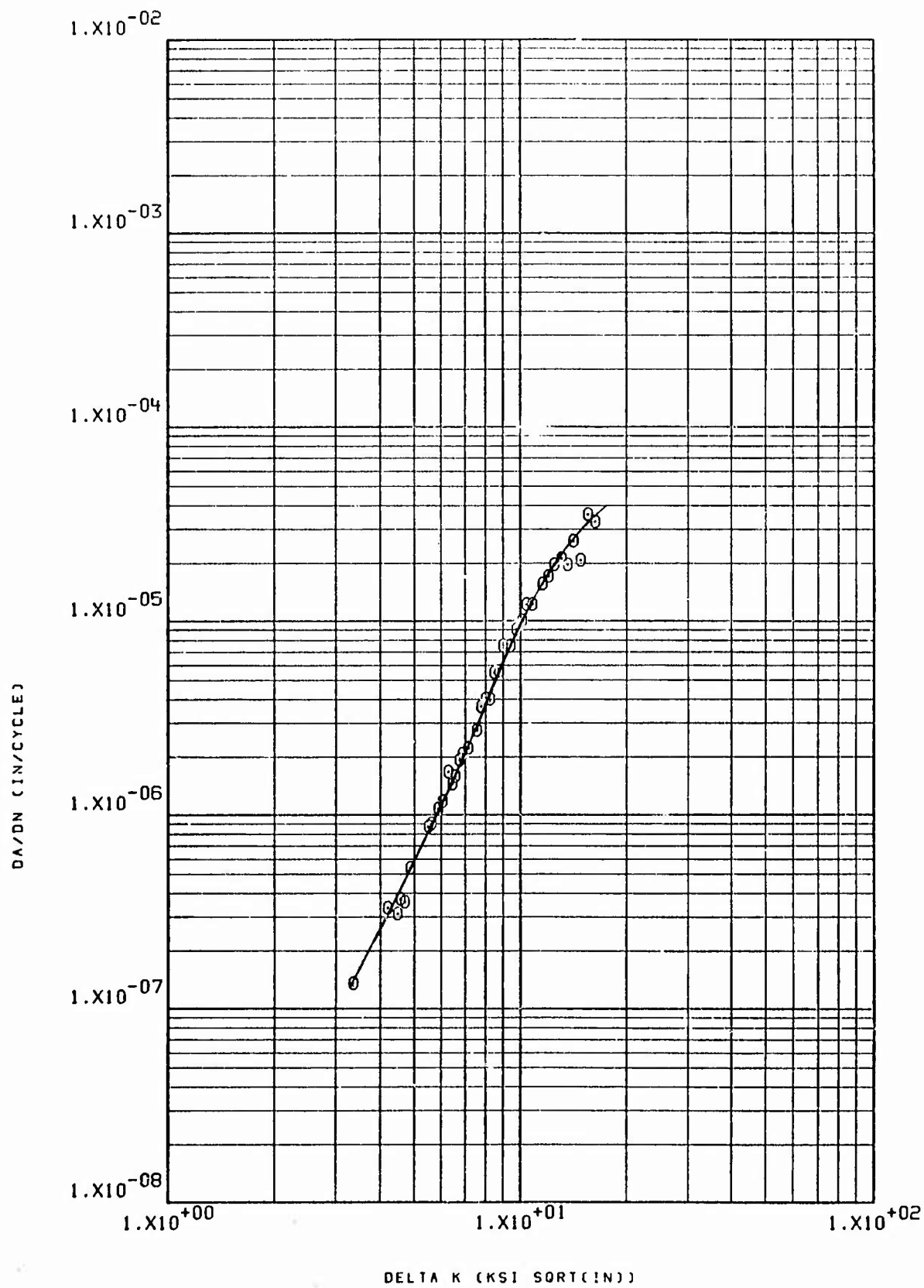


5 NRW 17-1 7075-17651

L.H.A.

R.T. 360CPH R=.08



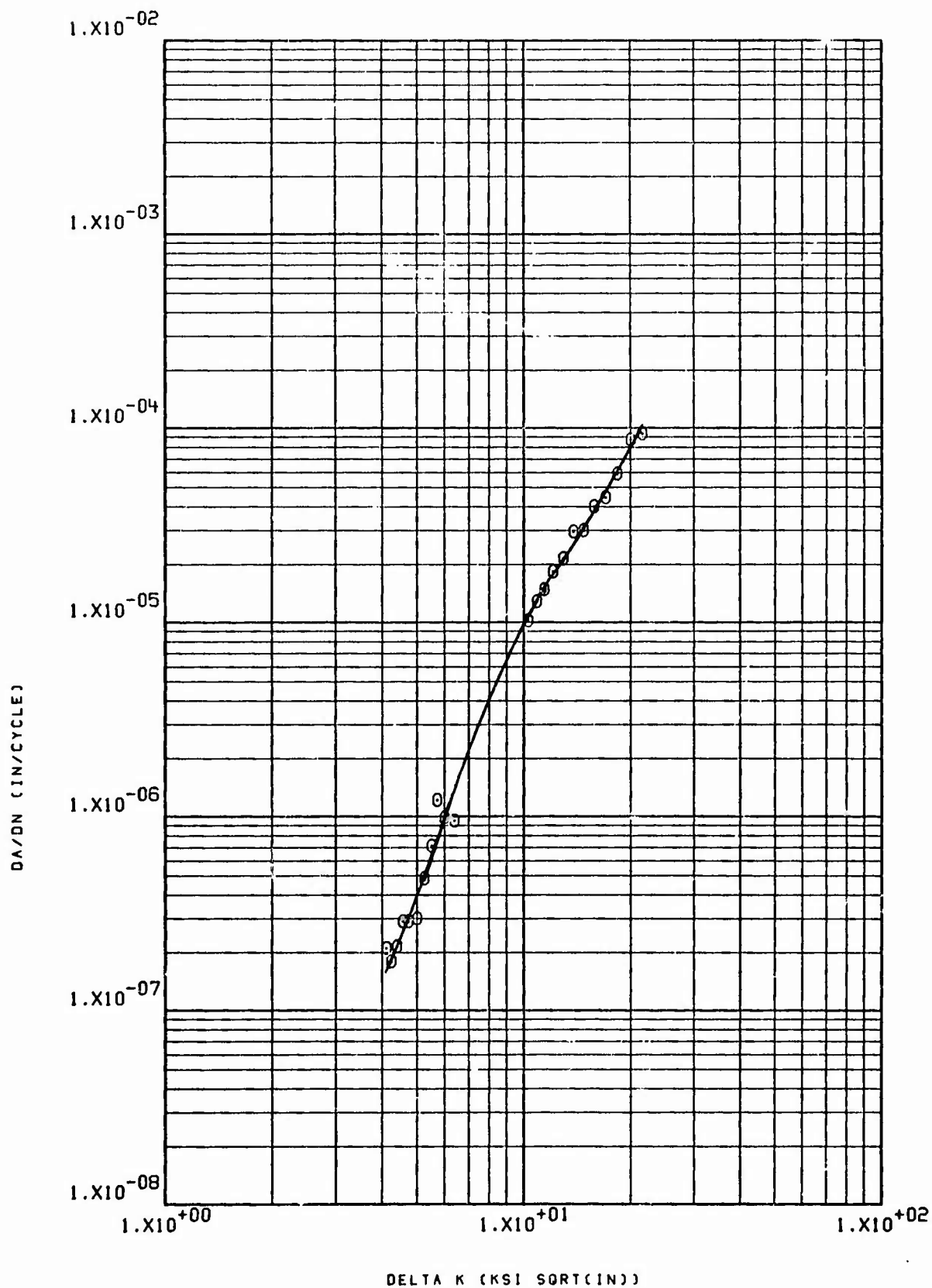


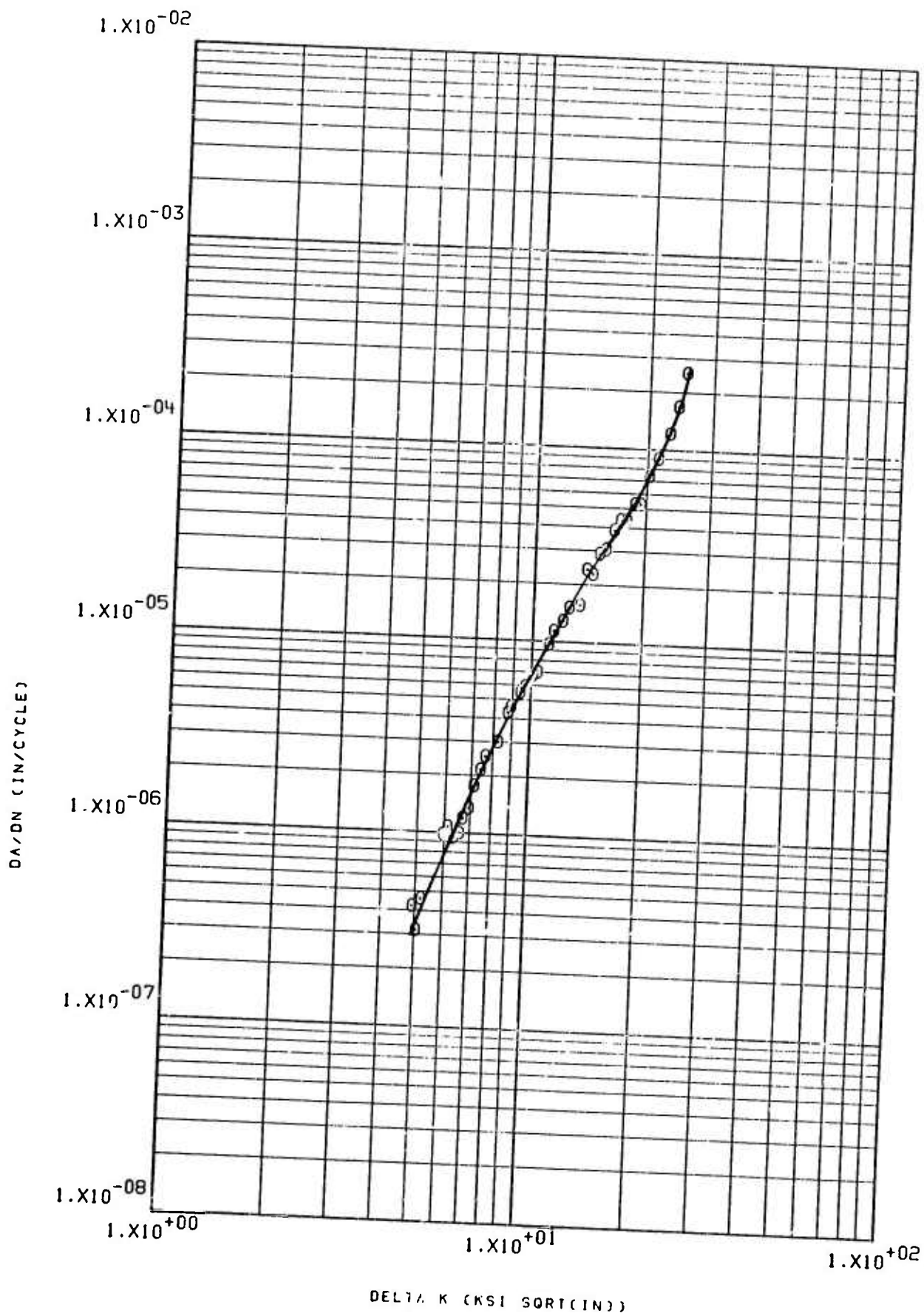
5 NRW 17-5 7075-17651

L.H.A.

R.1. 360CPH R=.3

B-25

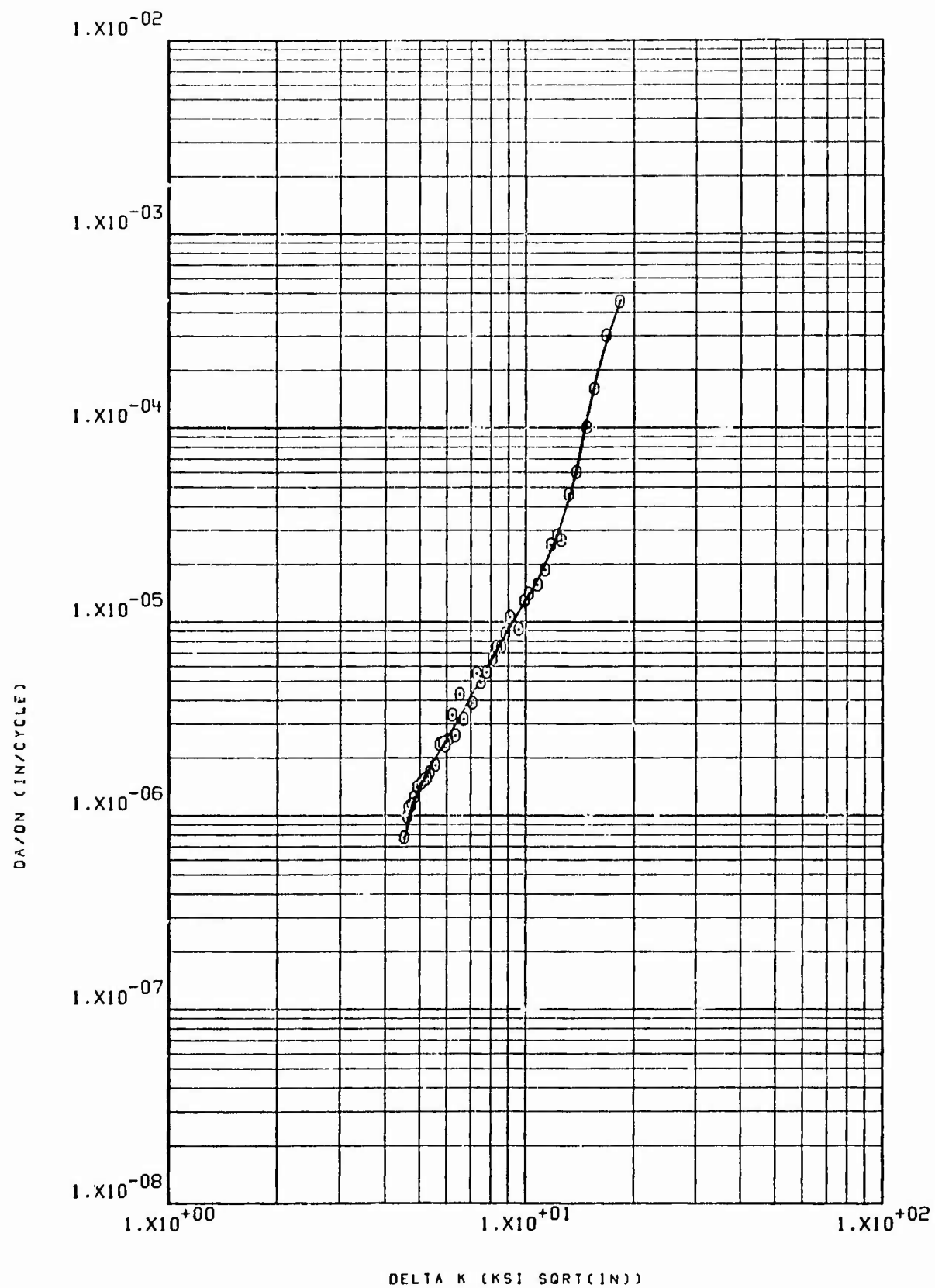




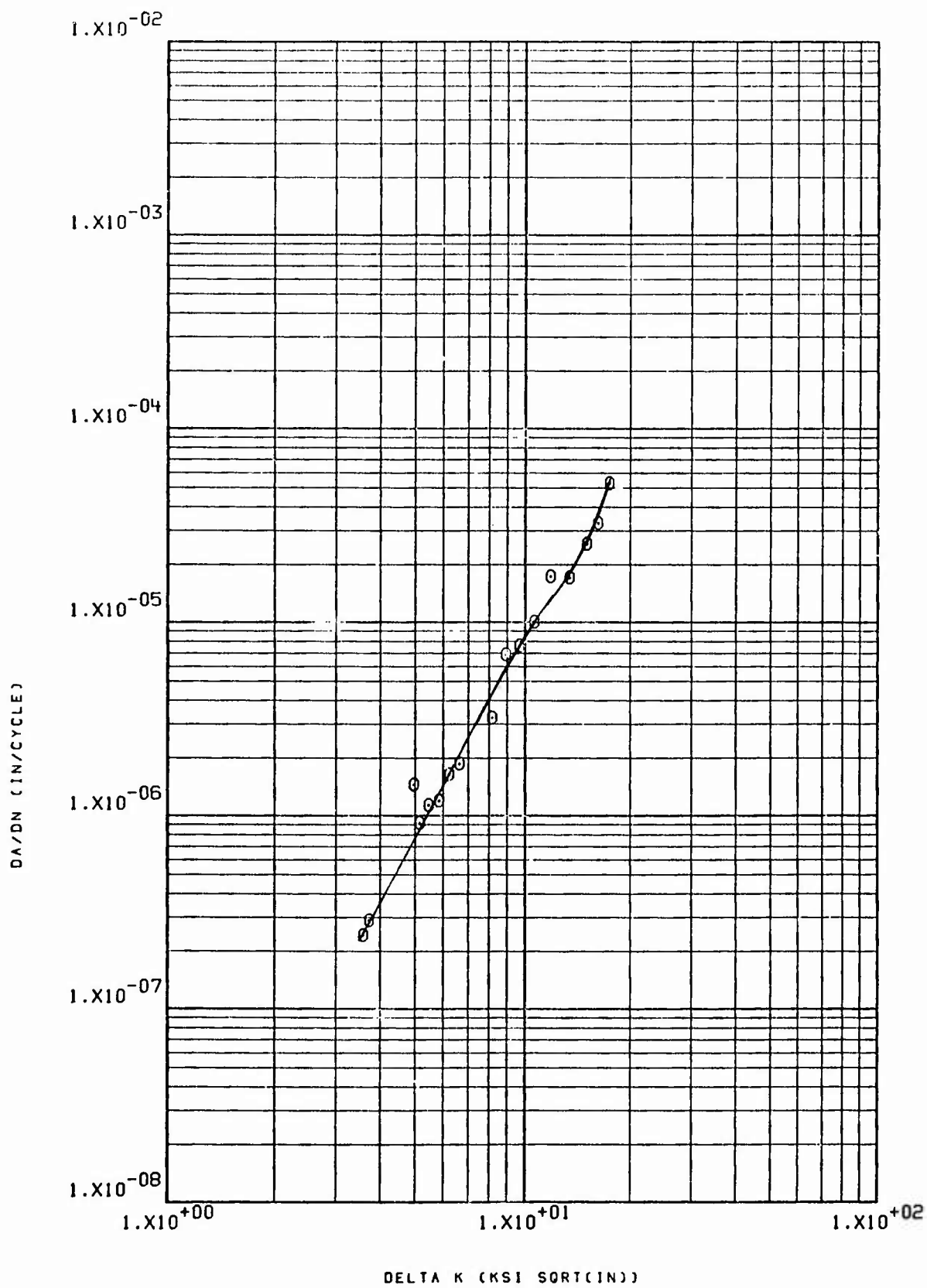
5 NRW 17-9 7075-17651

L.H.A.

R.T. 60CPM R=.08



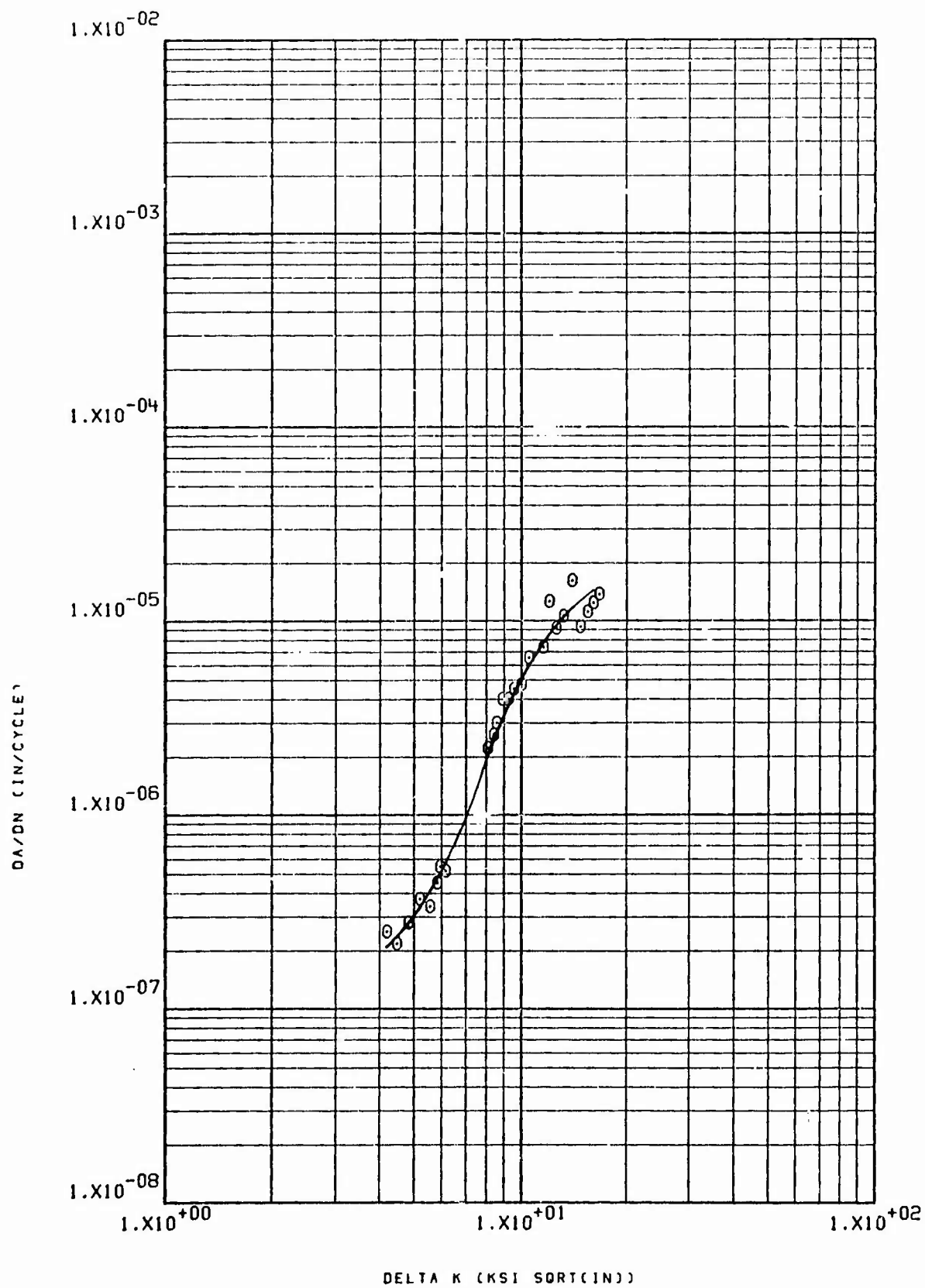
5 NRW 17-10 7075-17351 LHA RT R=0.5 360CPM



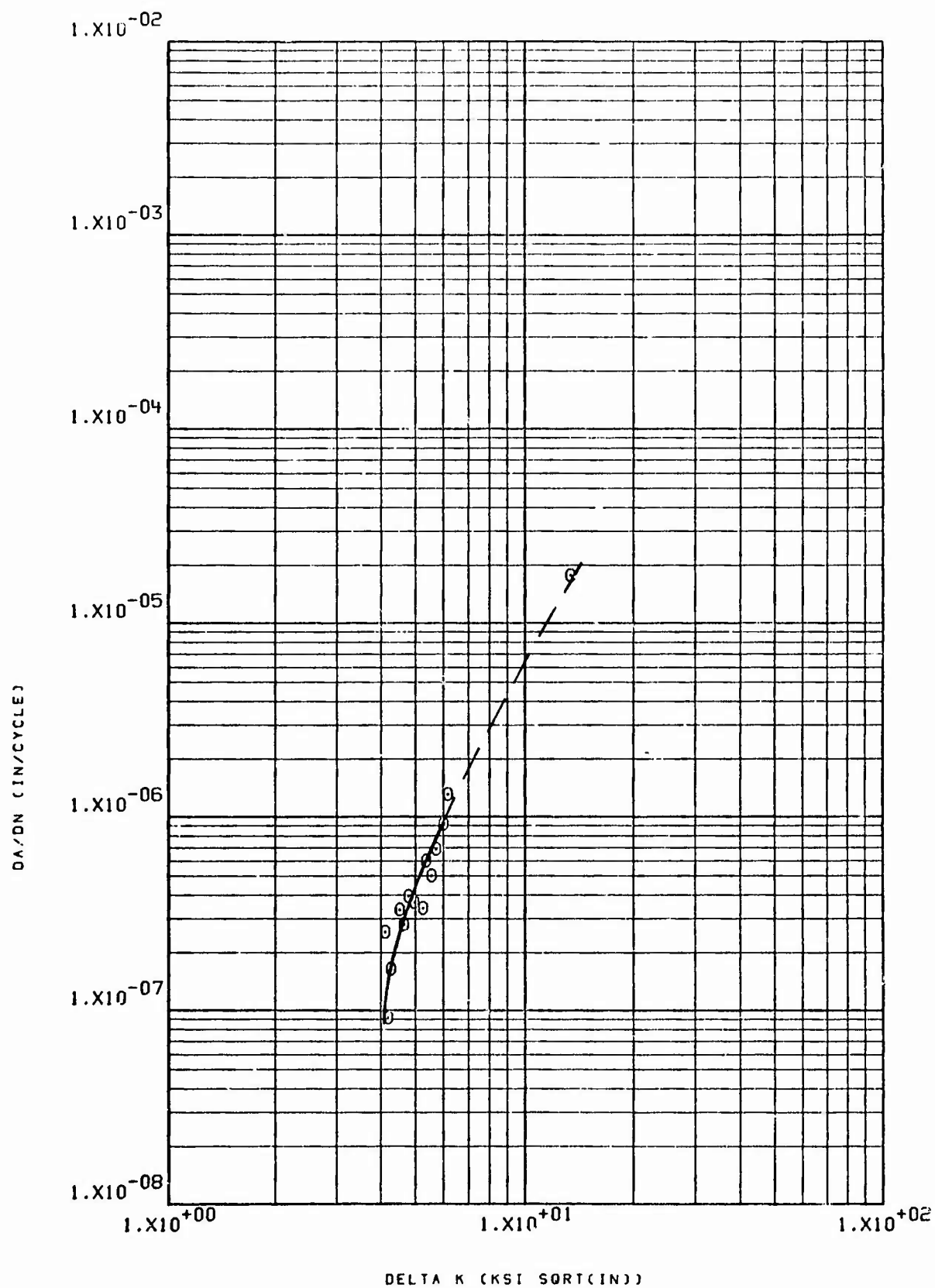
5 NRW 17-11 7075-17651

SUMP

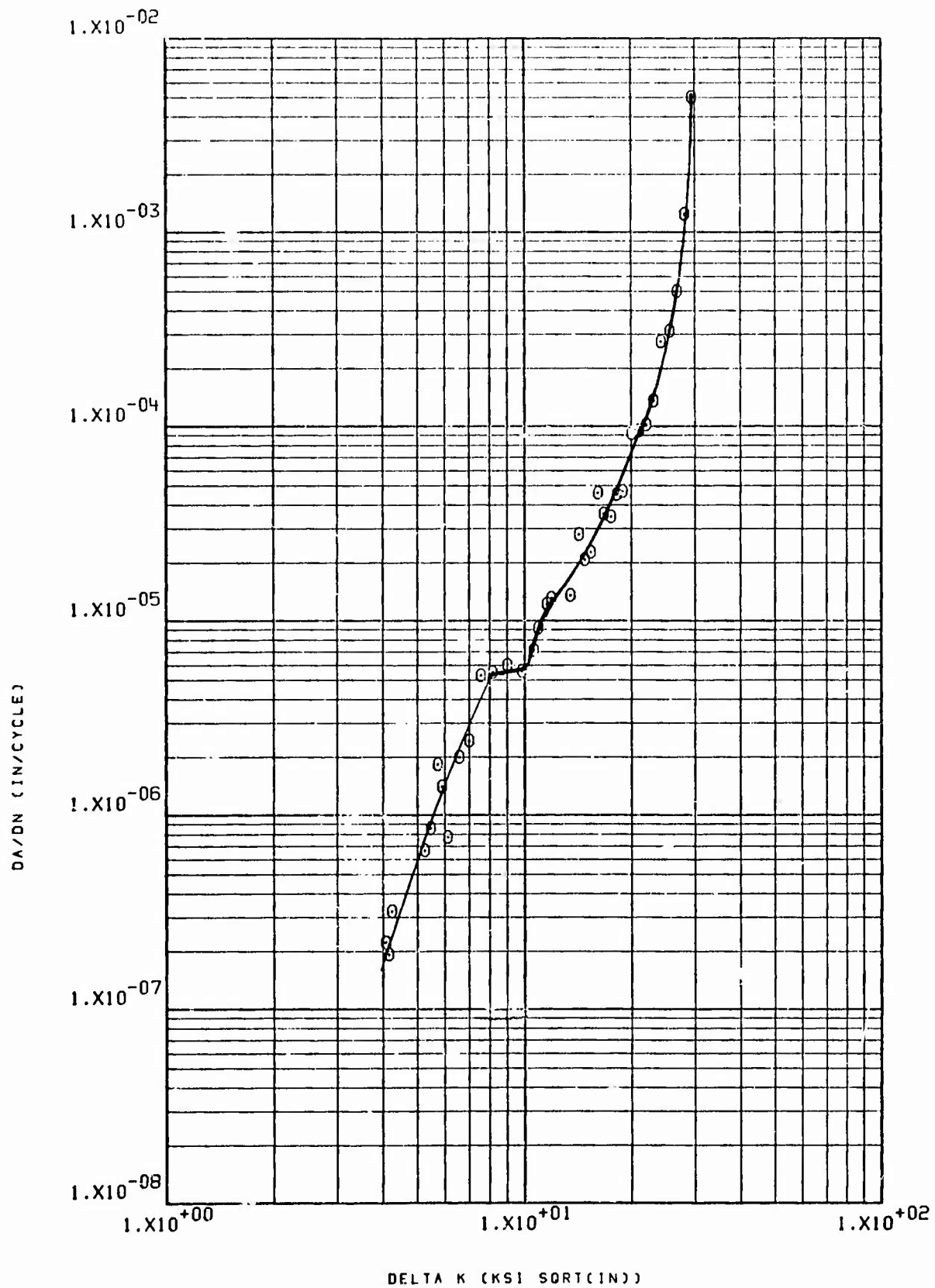
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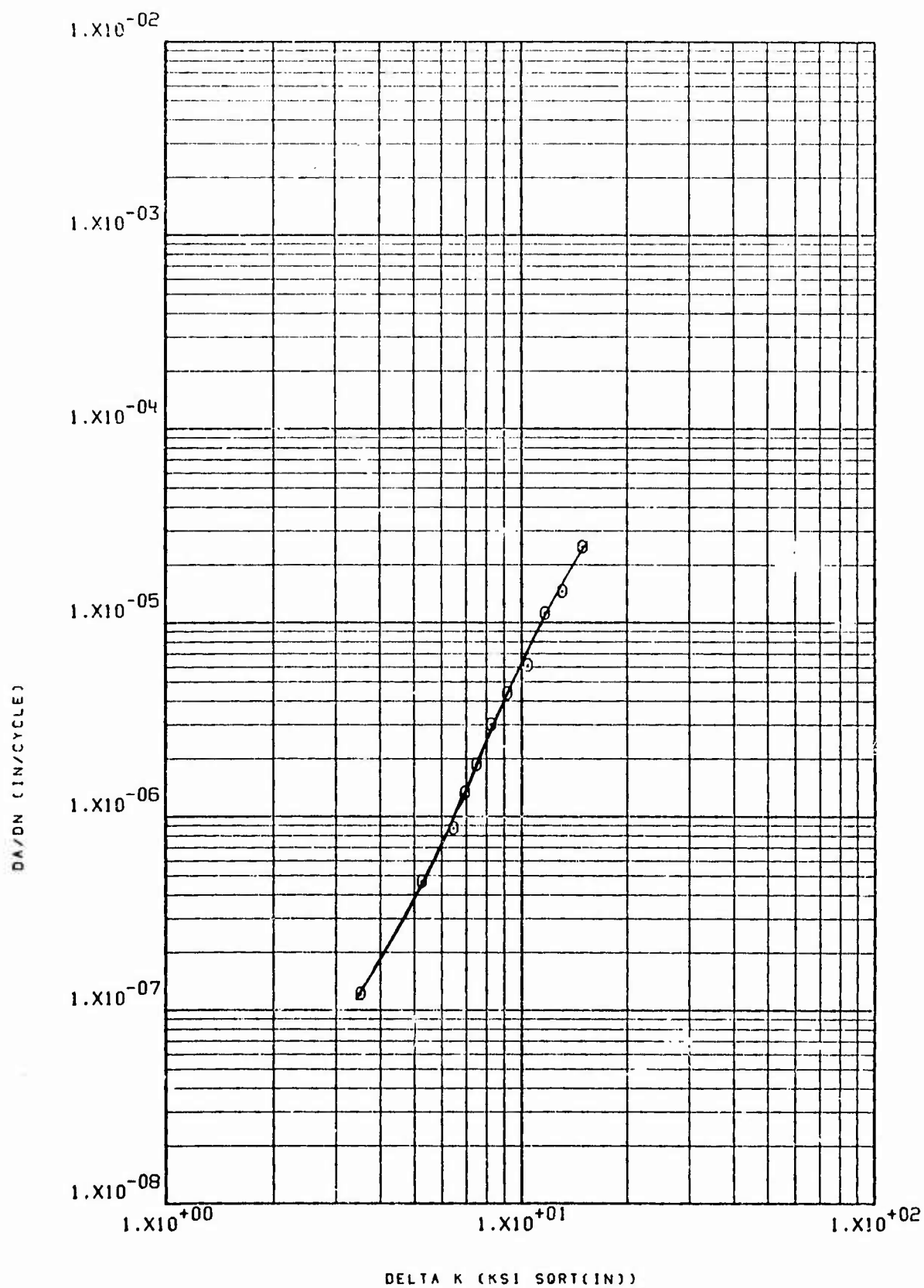


5 NRW 17-14 7075-T7351 LHA RT R=.08 360CPM

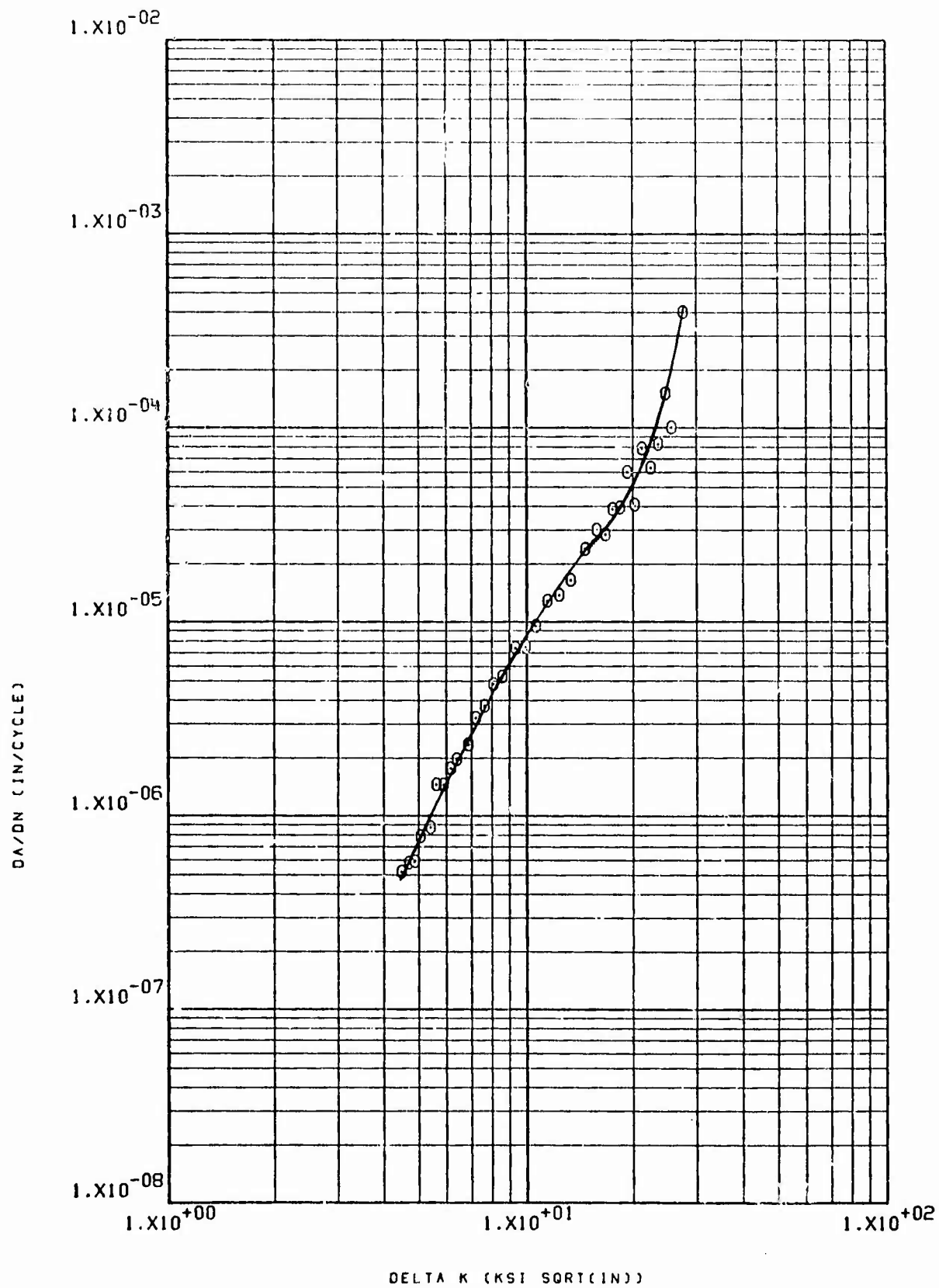


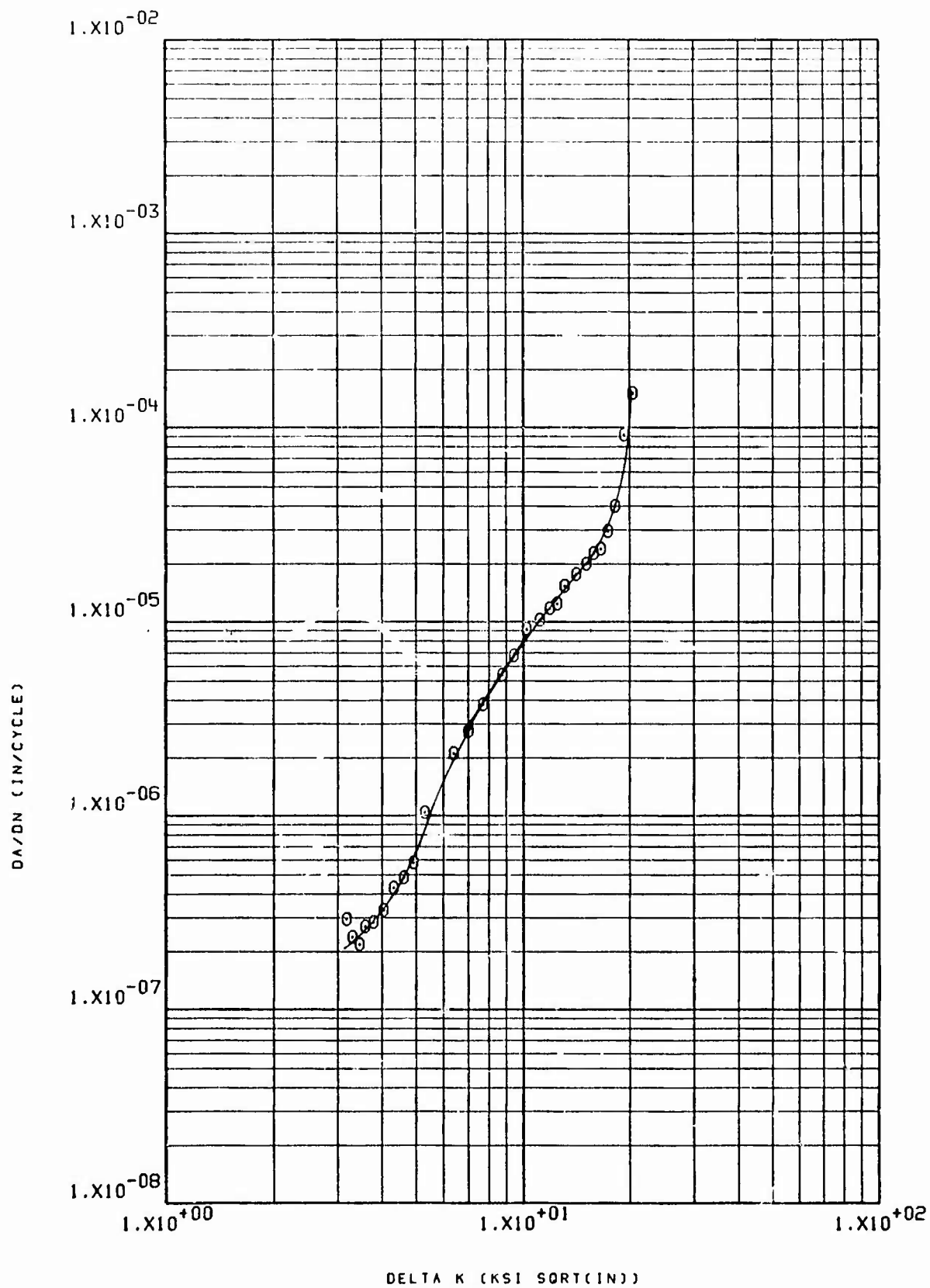
5 NVR 17-16 7075-17351 LHA RT R=.08 360CPM





7NRW27-6A 2219-TP51 RM TEMP 360CPM R=.08 LAB AIR

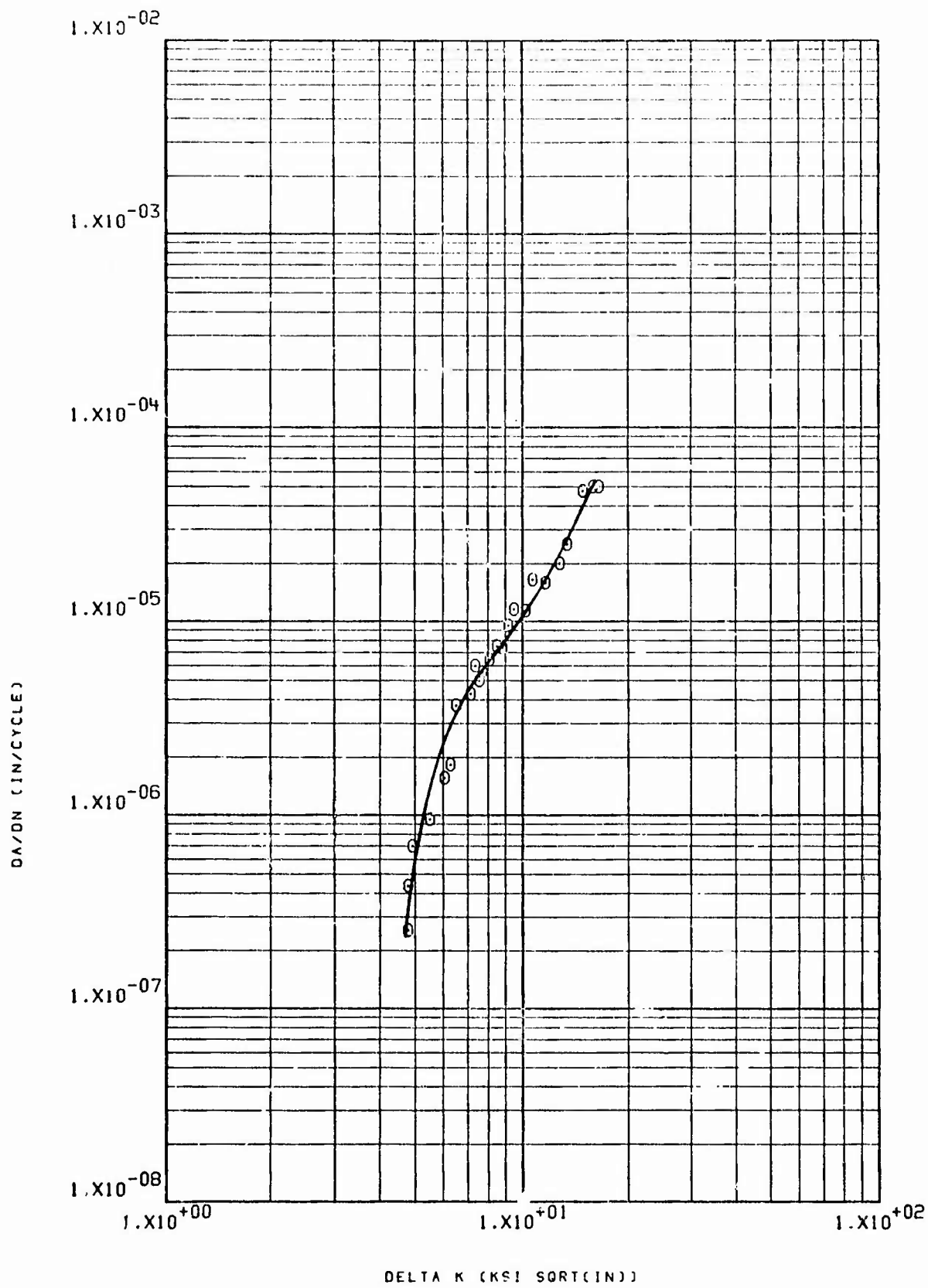




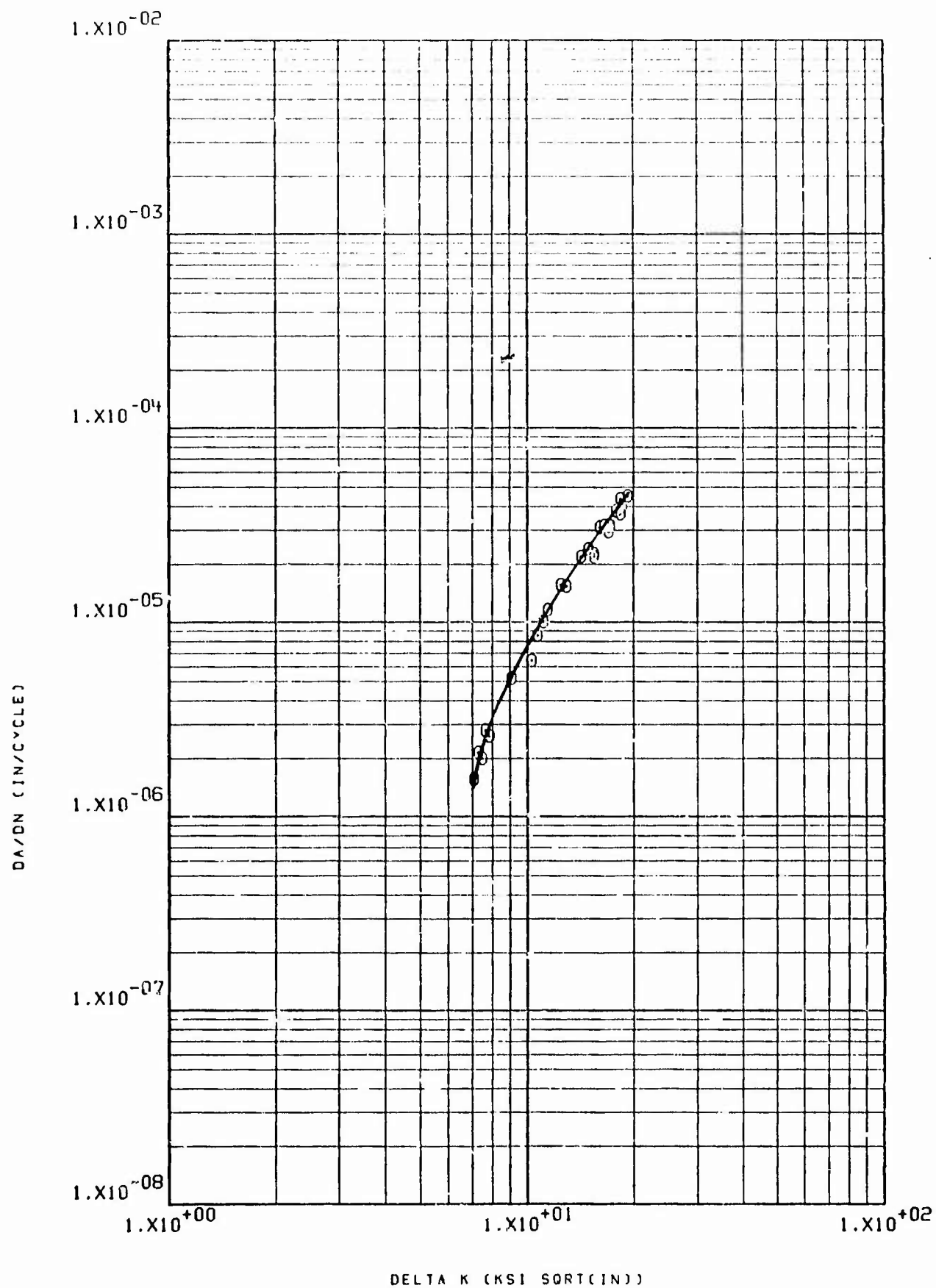
7 NRW 27-13 2219-T851

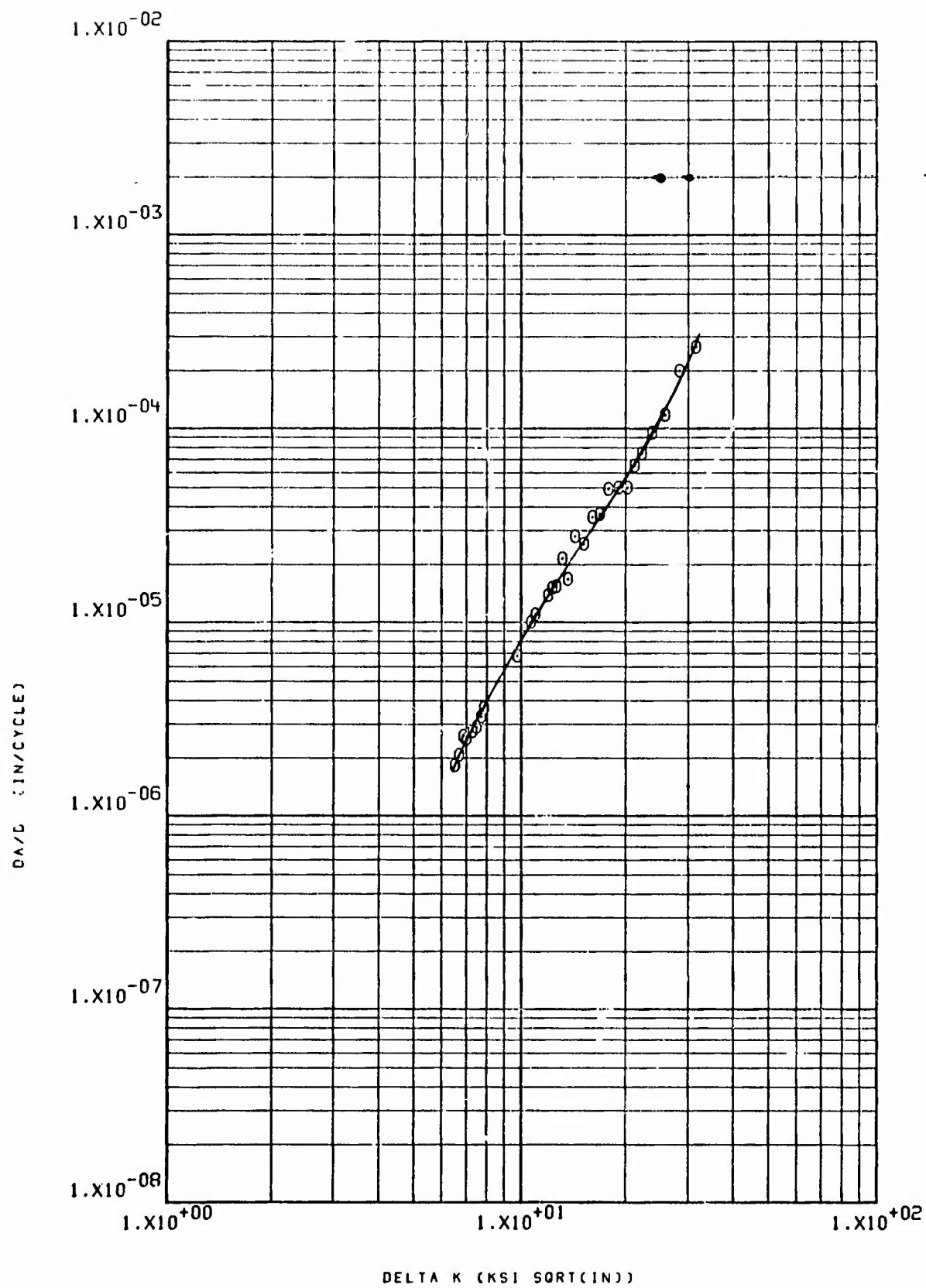
L.H.A.

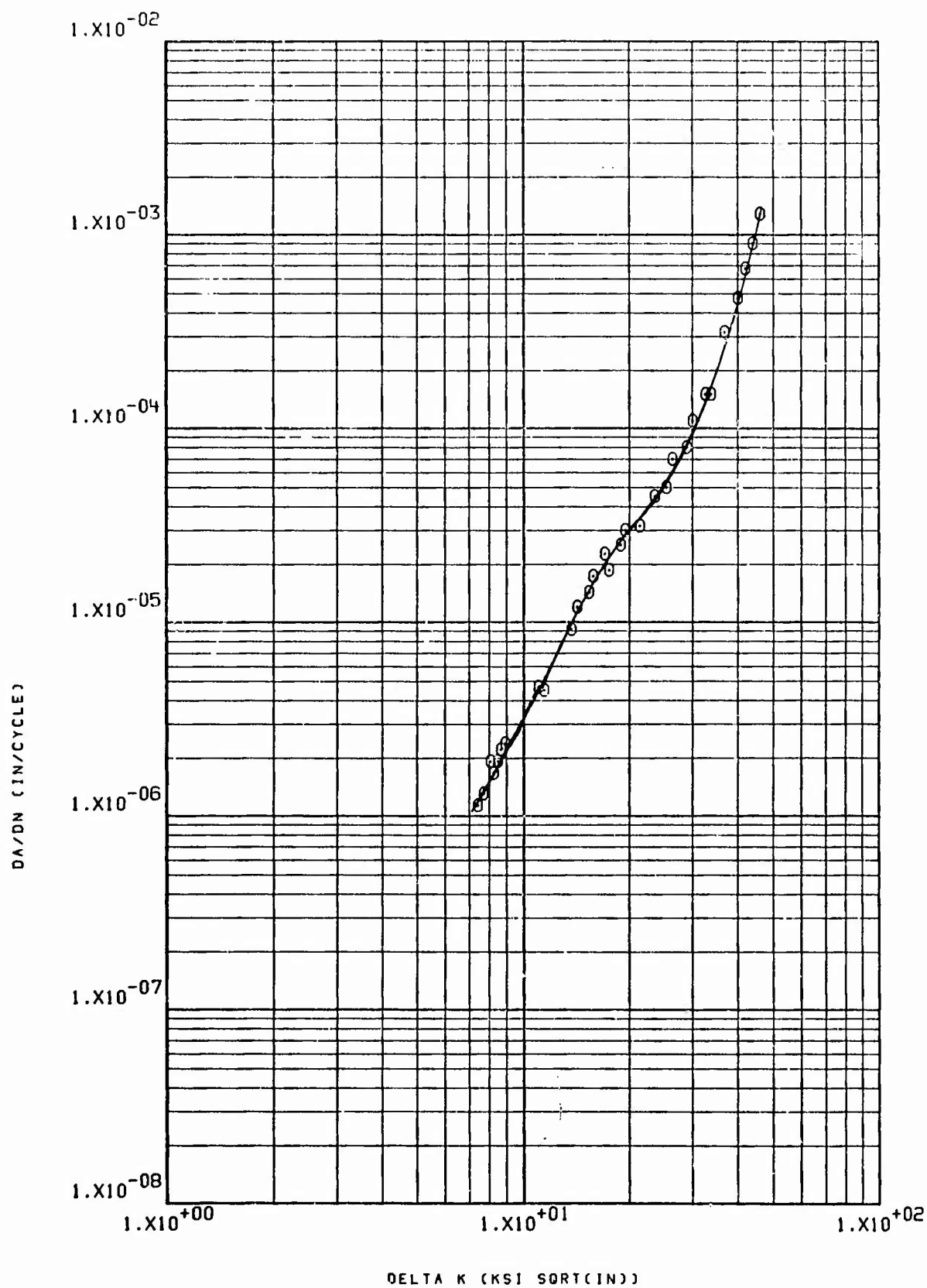
R.T. 360CPM R=.5



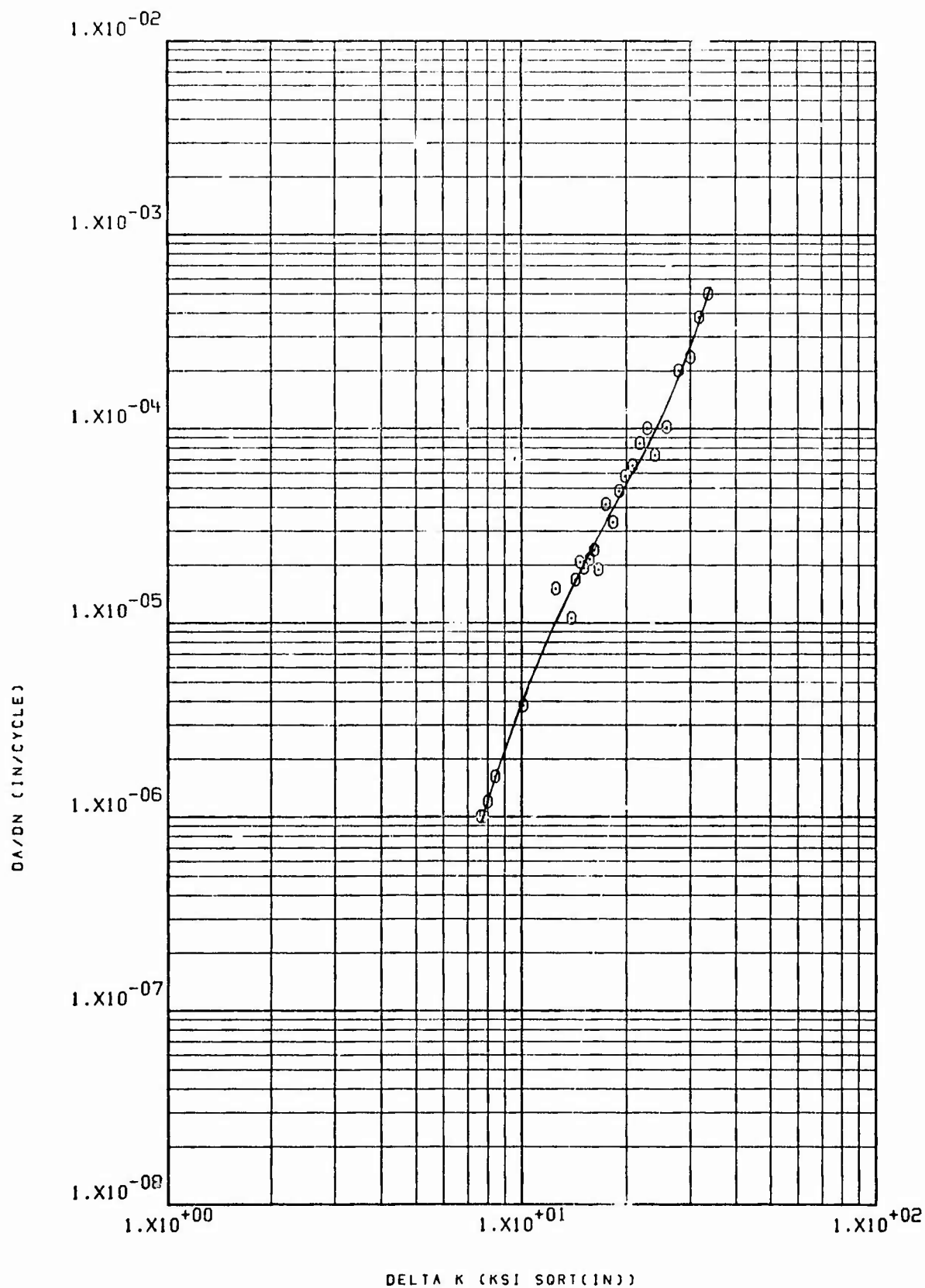
7 NRW 27-19 2219-T851 STW RT R=.50 60CPM

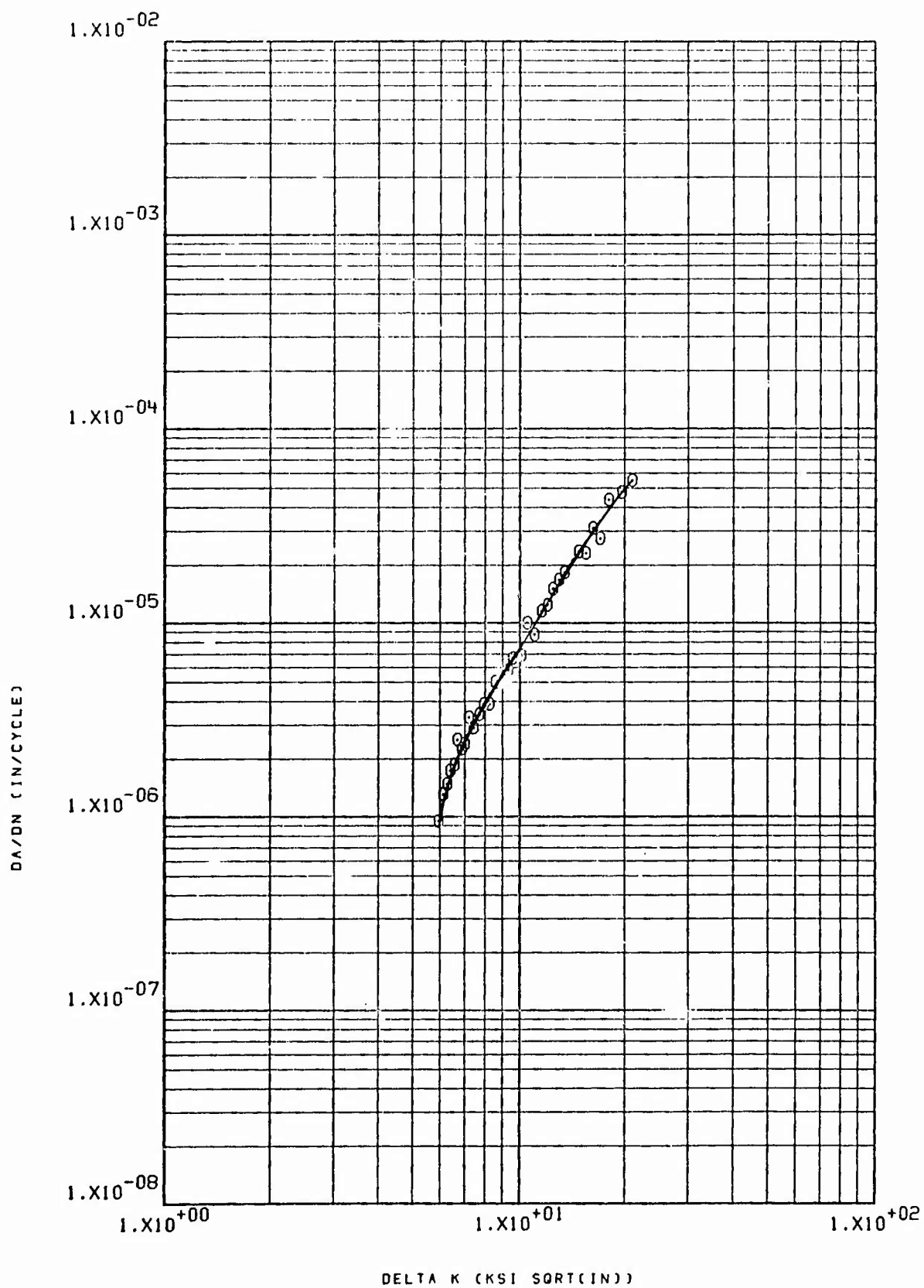




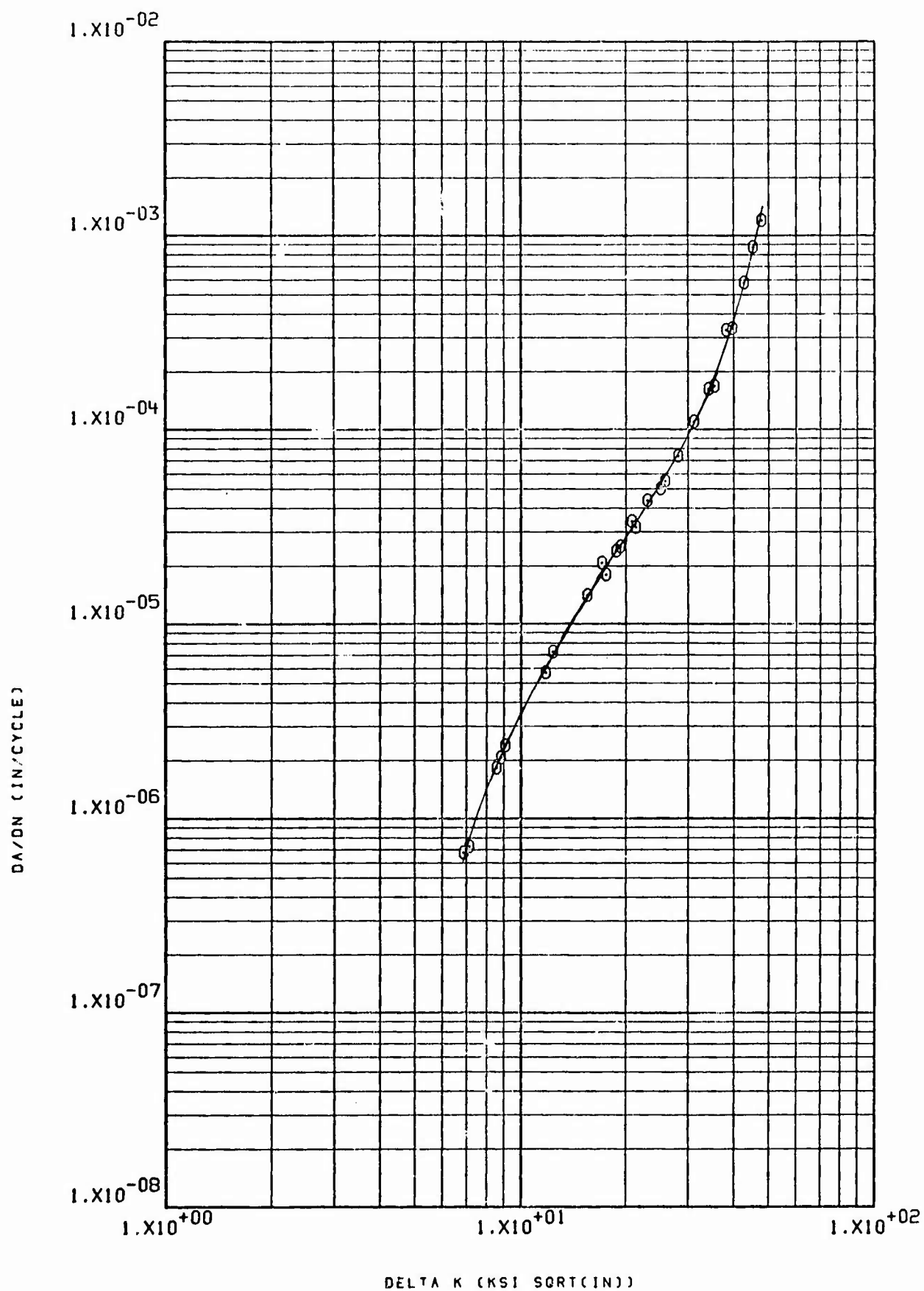


7 NRW 27-25 2219-T851 LHA RT R=.08 360CPH



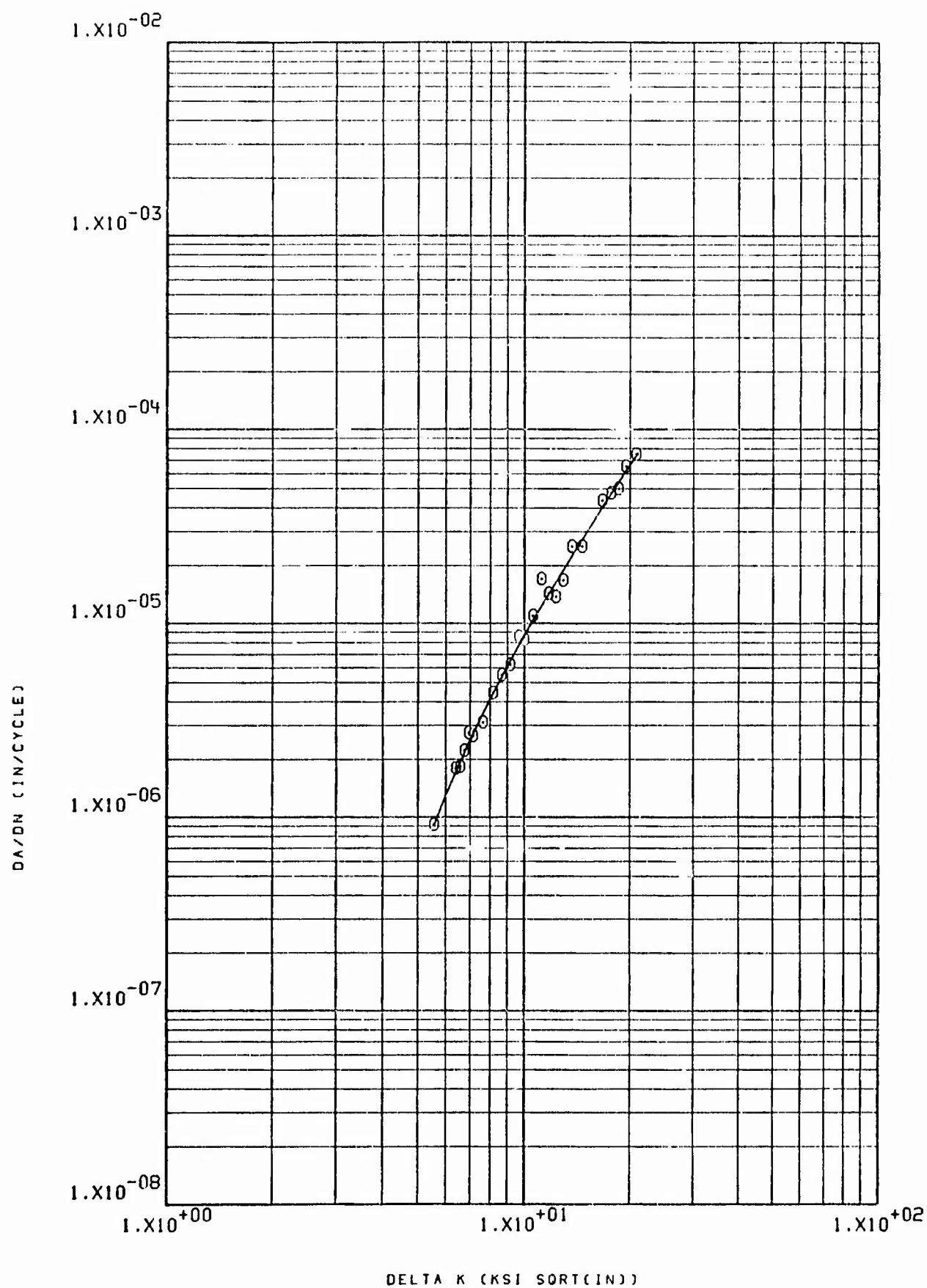


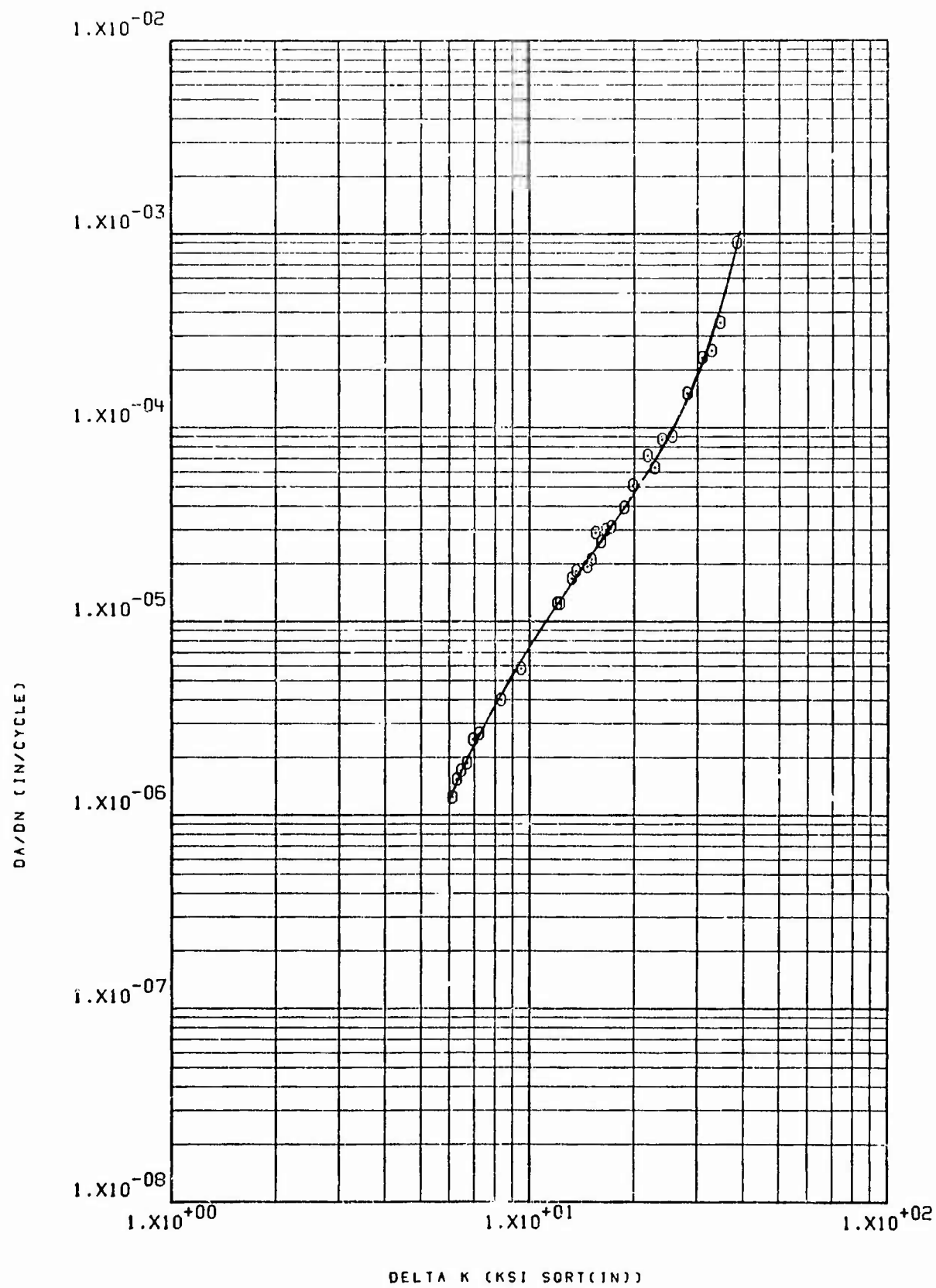
7 NRW 27-27 2219-T851 SHOP RT R=.08 60CPM

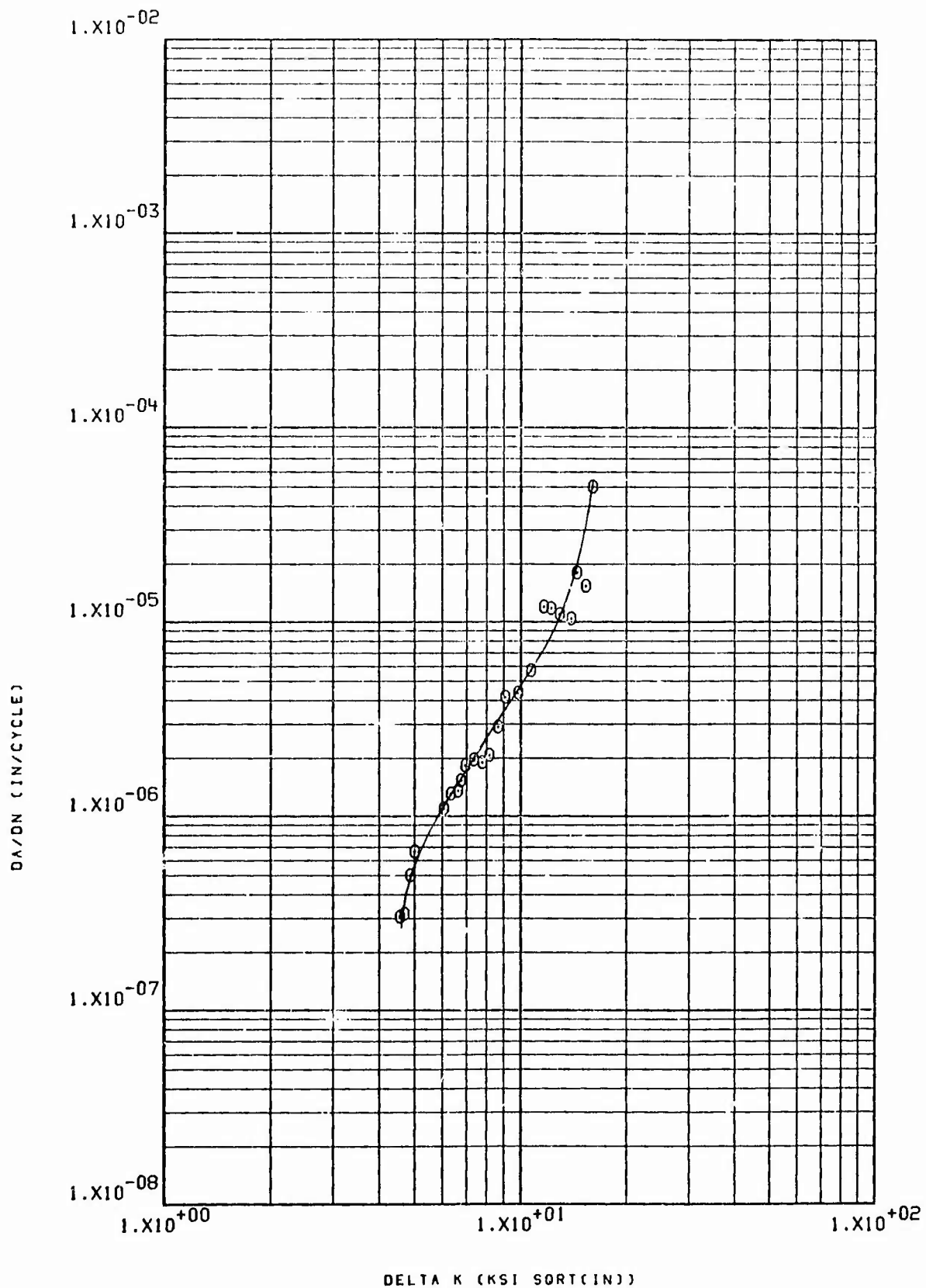


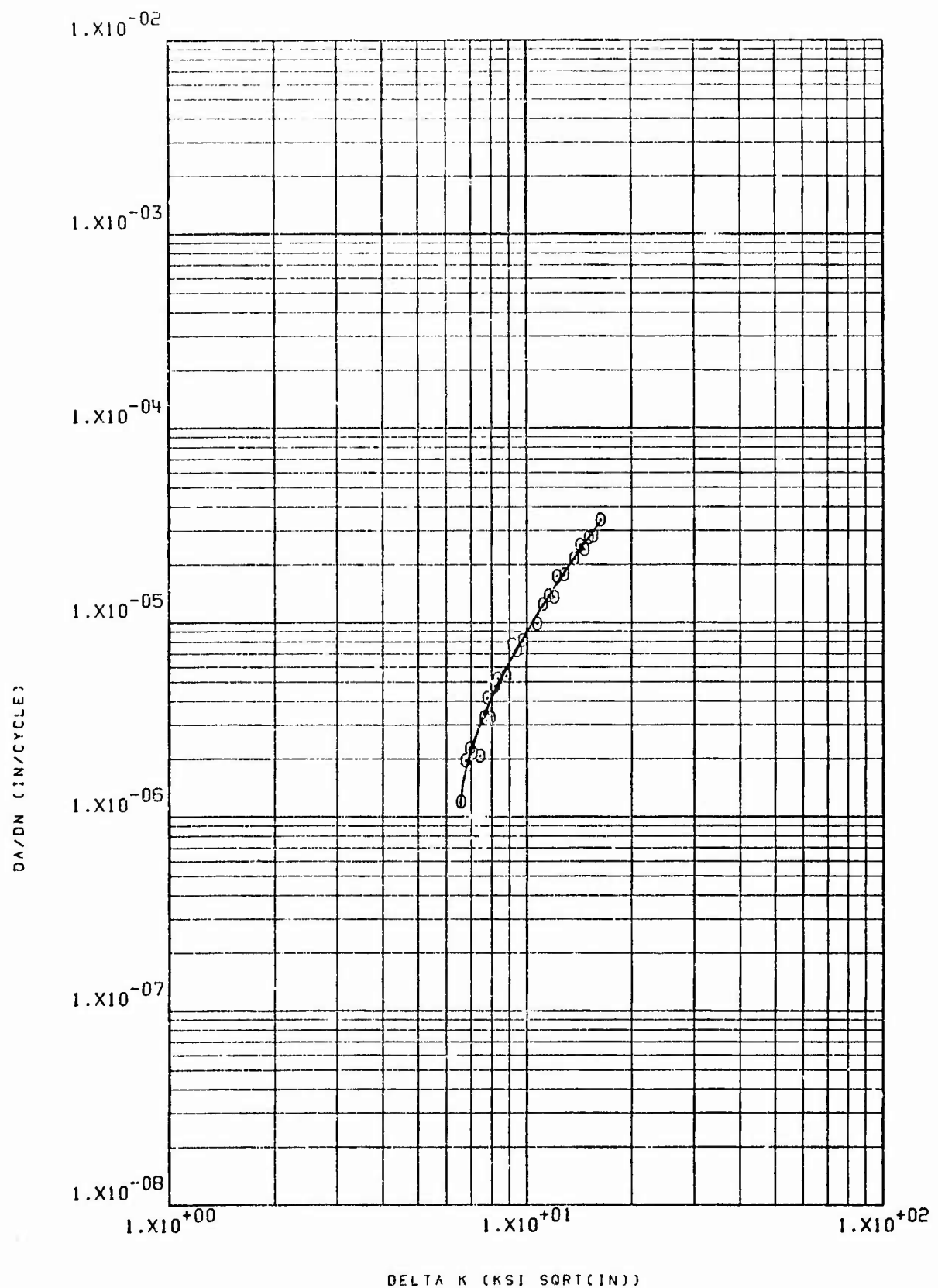
7 NRW 27-30 2219-1851 LHA RT R=.08 360CPH

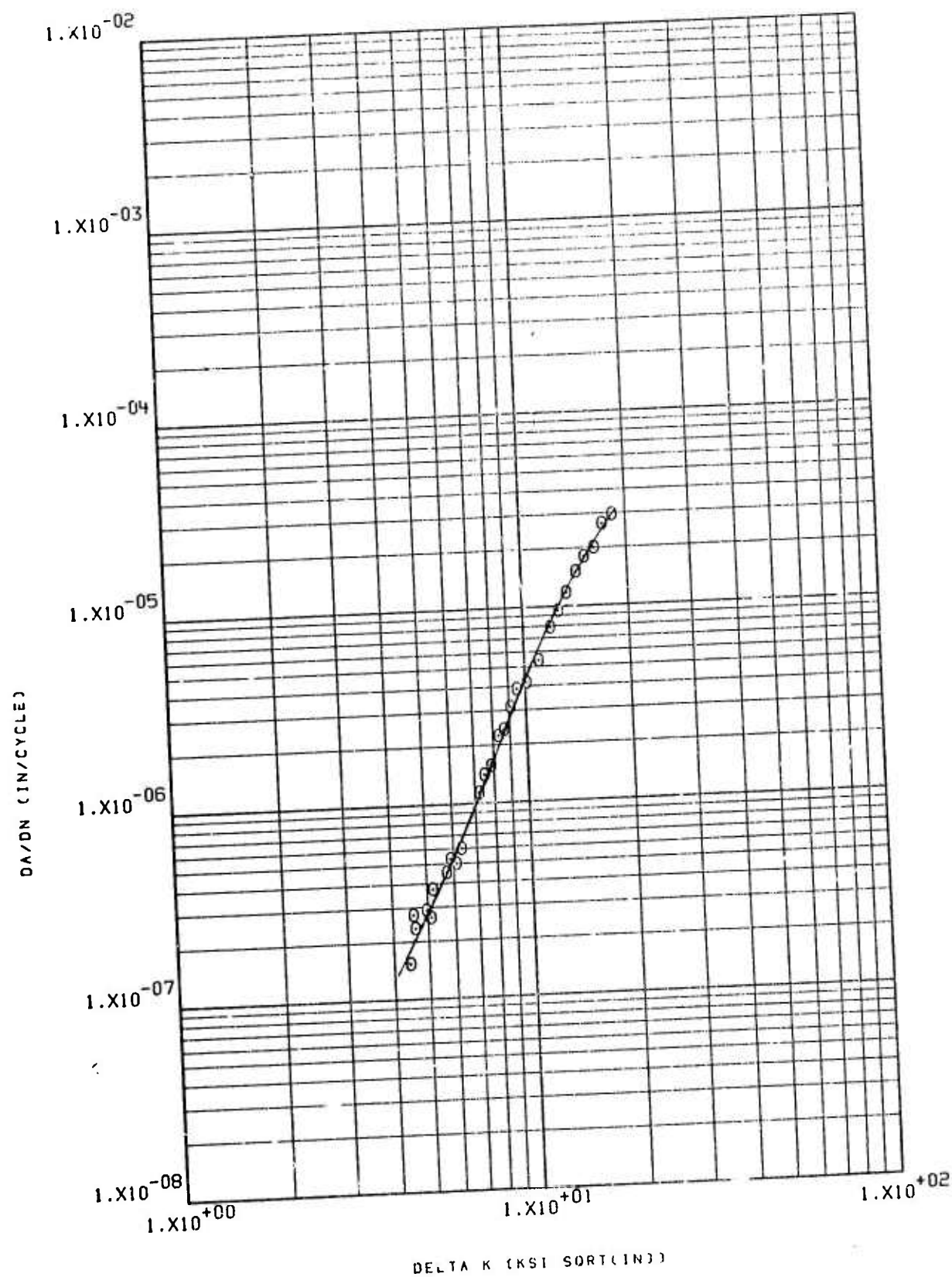
B-42







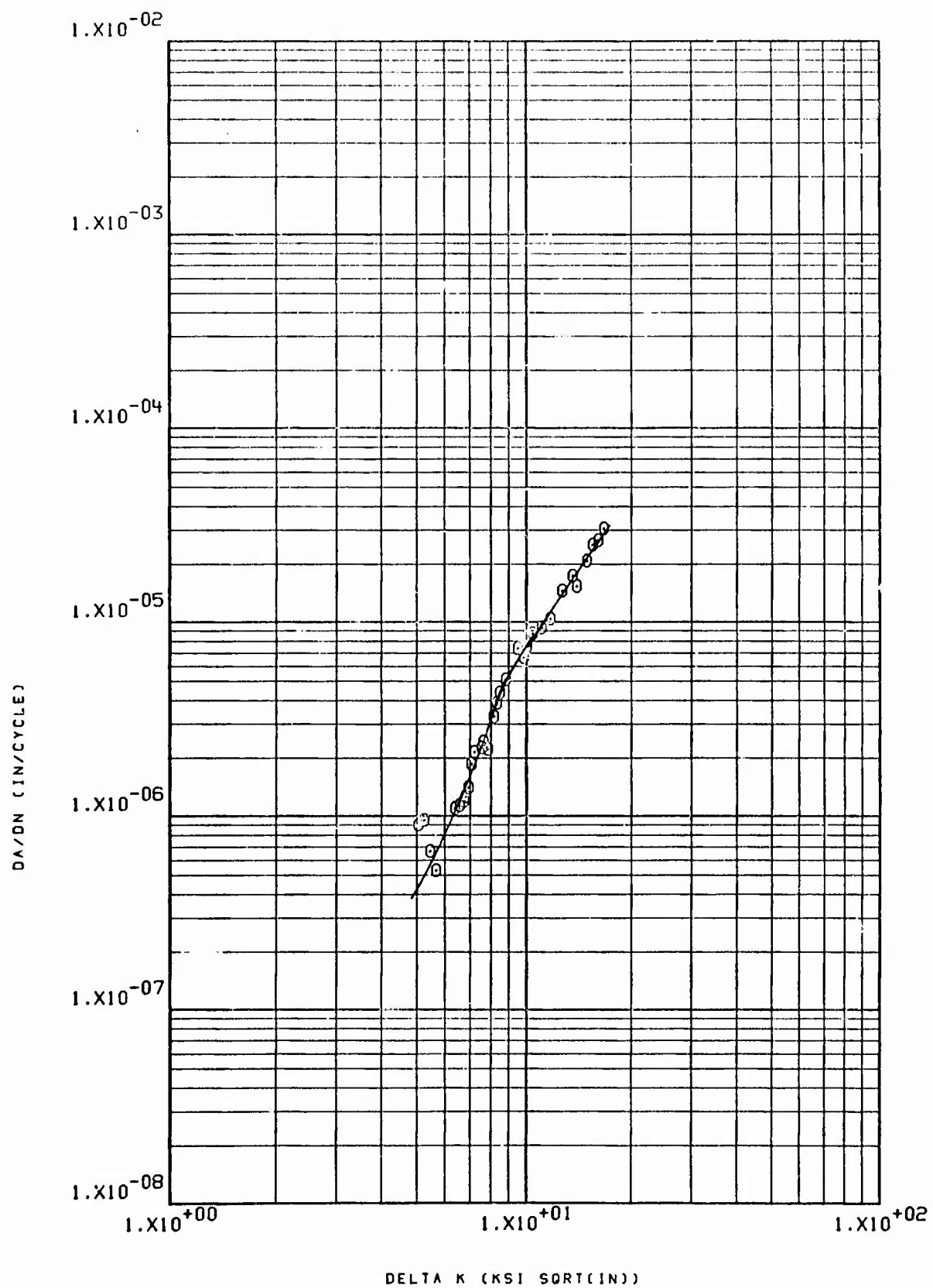


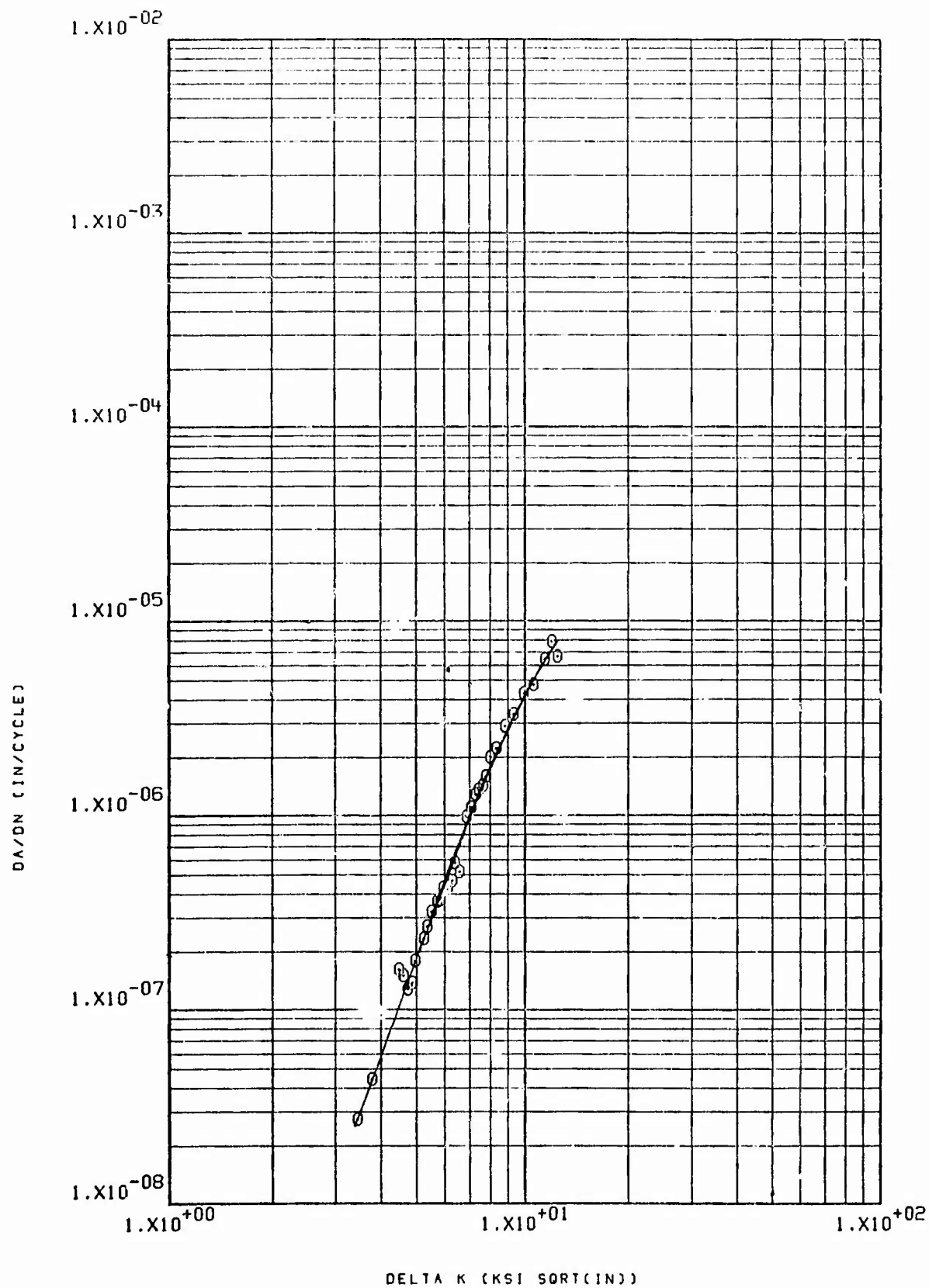


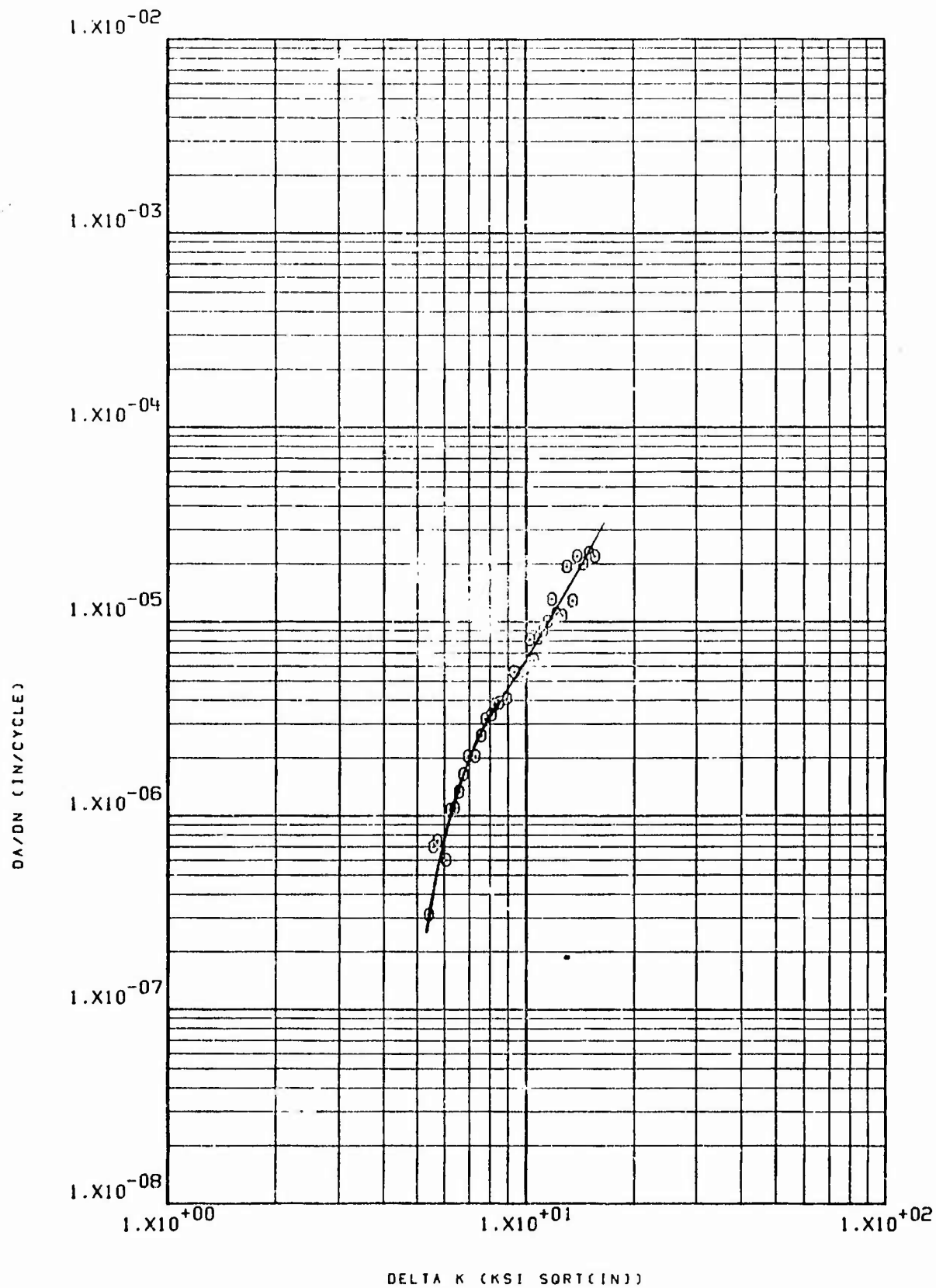
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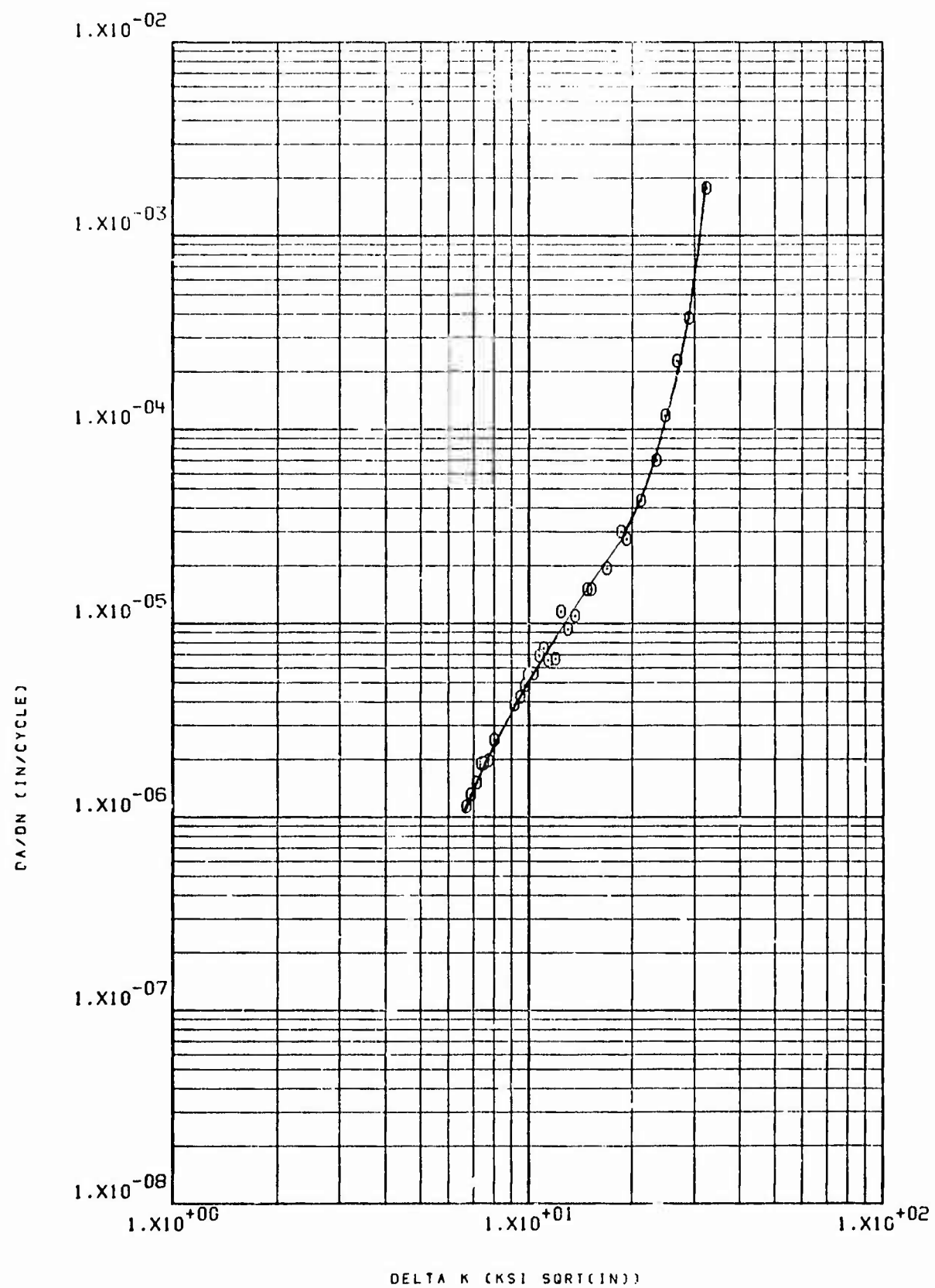
L.H.A. R.T. 360CPH R=.08

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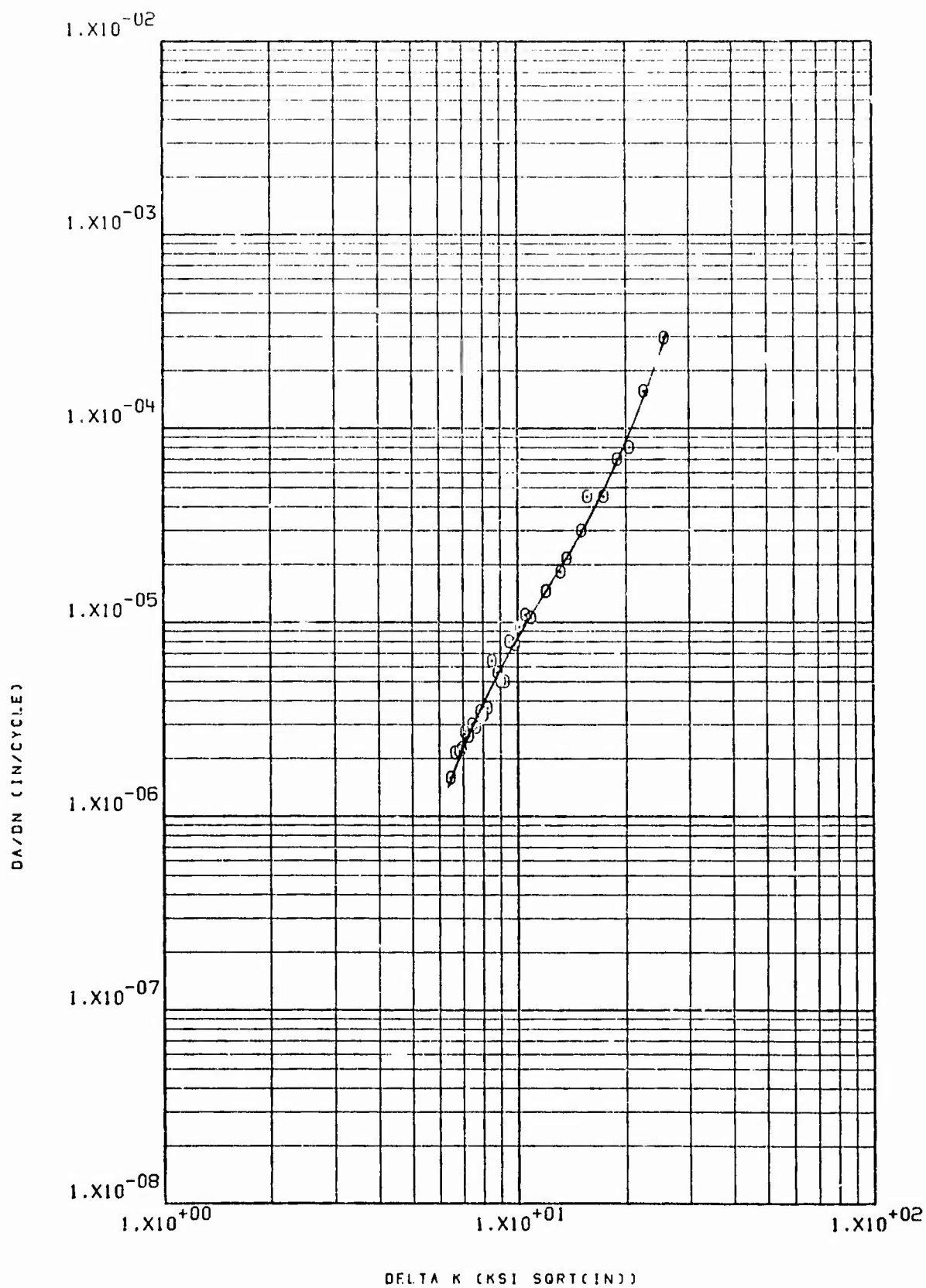




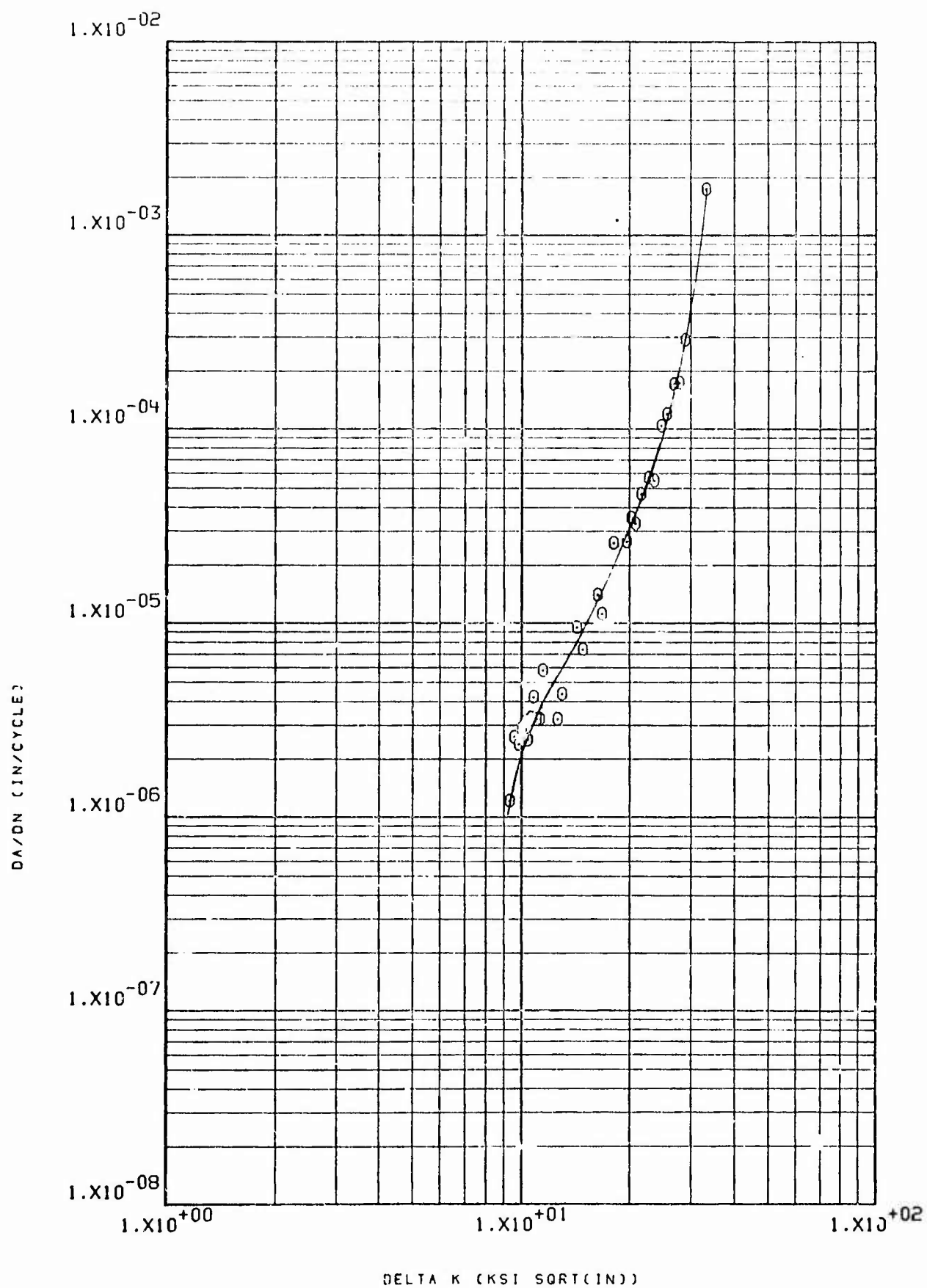


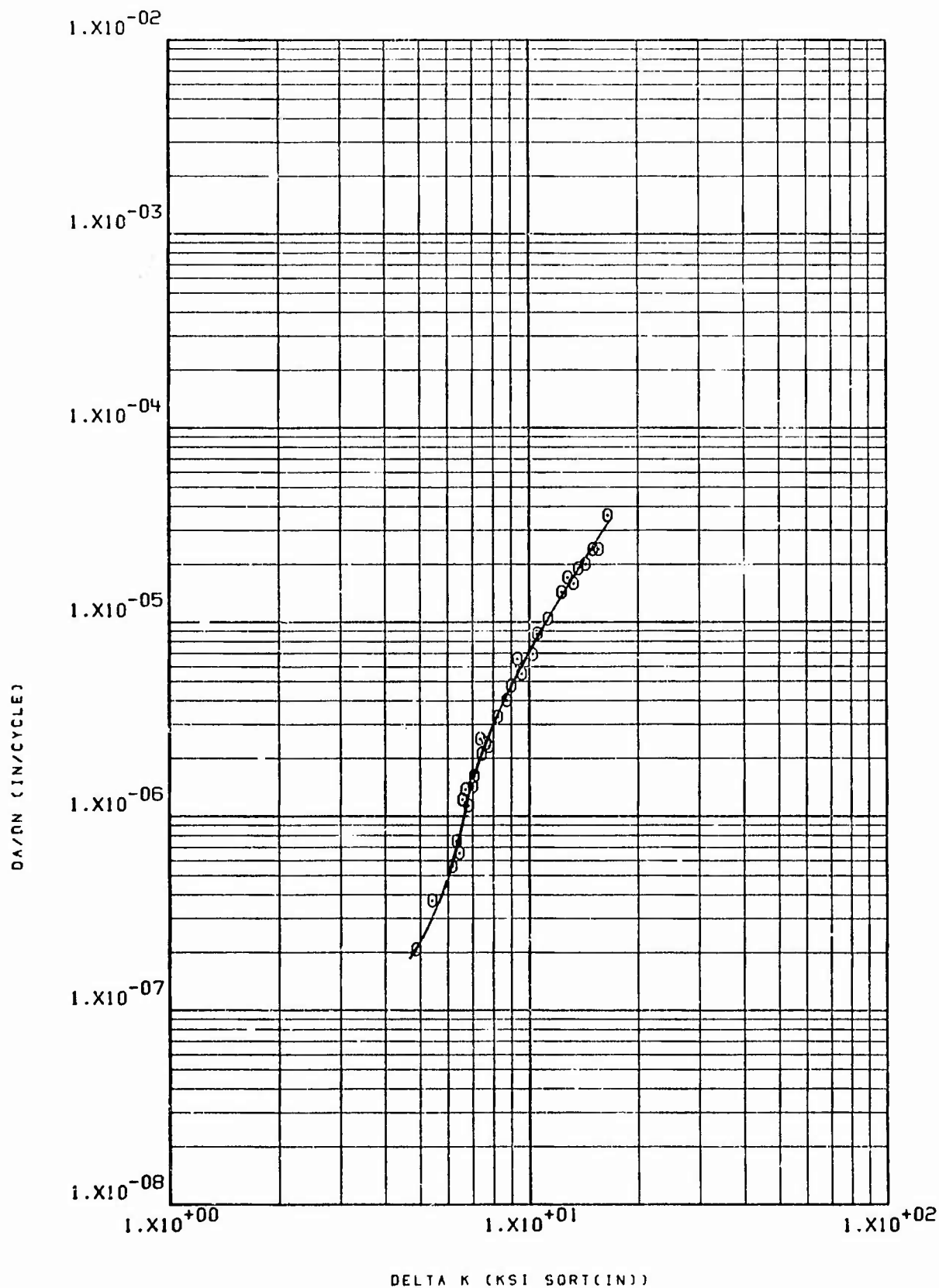


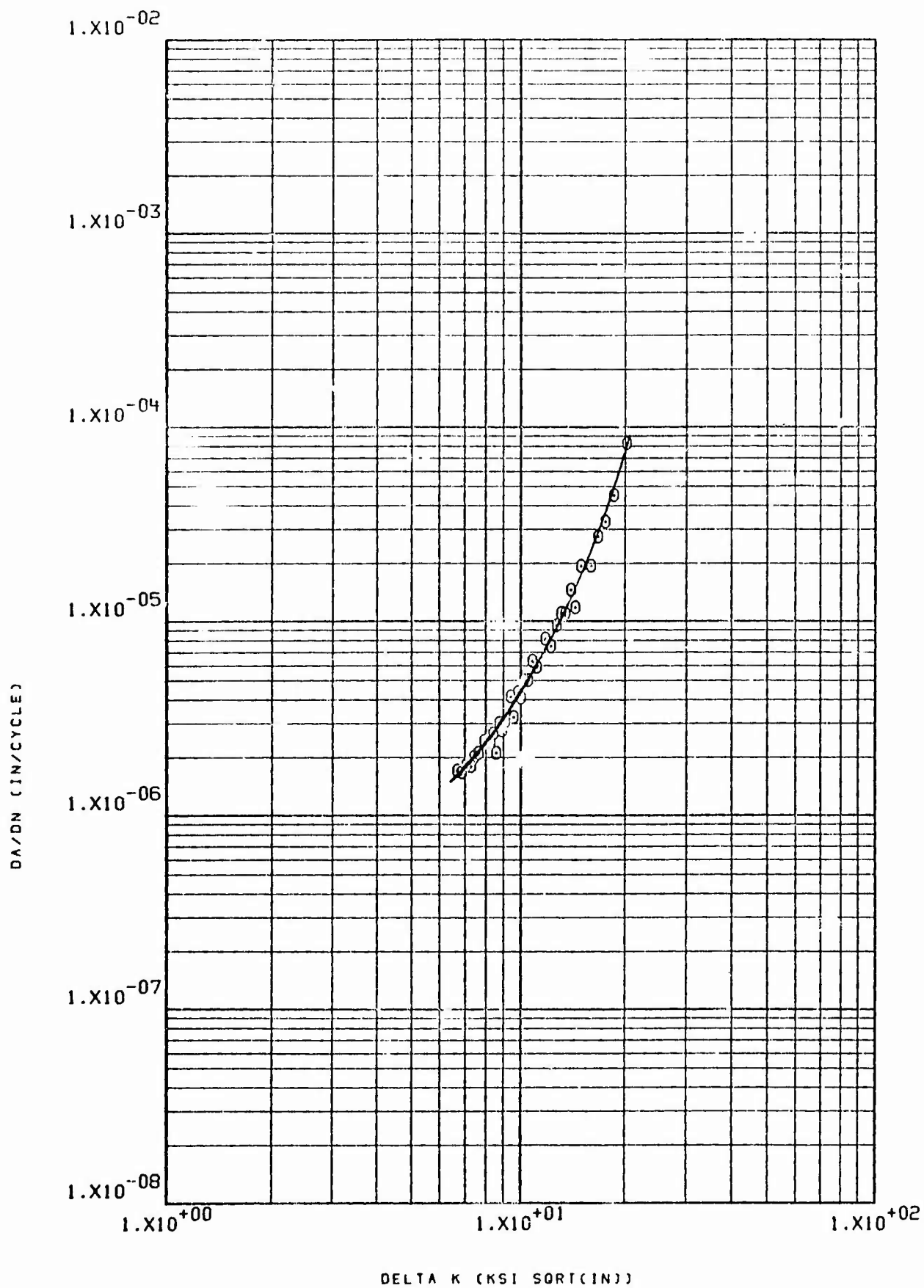
7 NWR 36-10 2219-1851 LHA RT R=.08 360 CPM

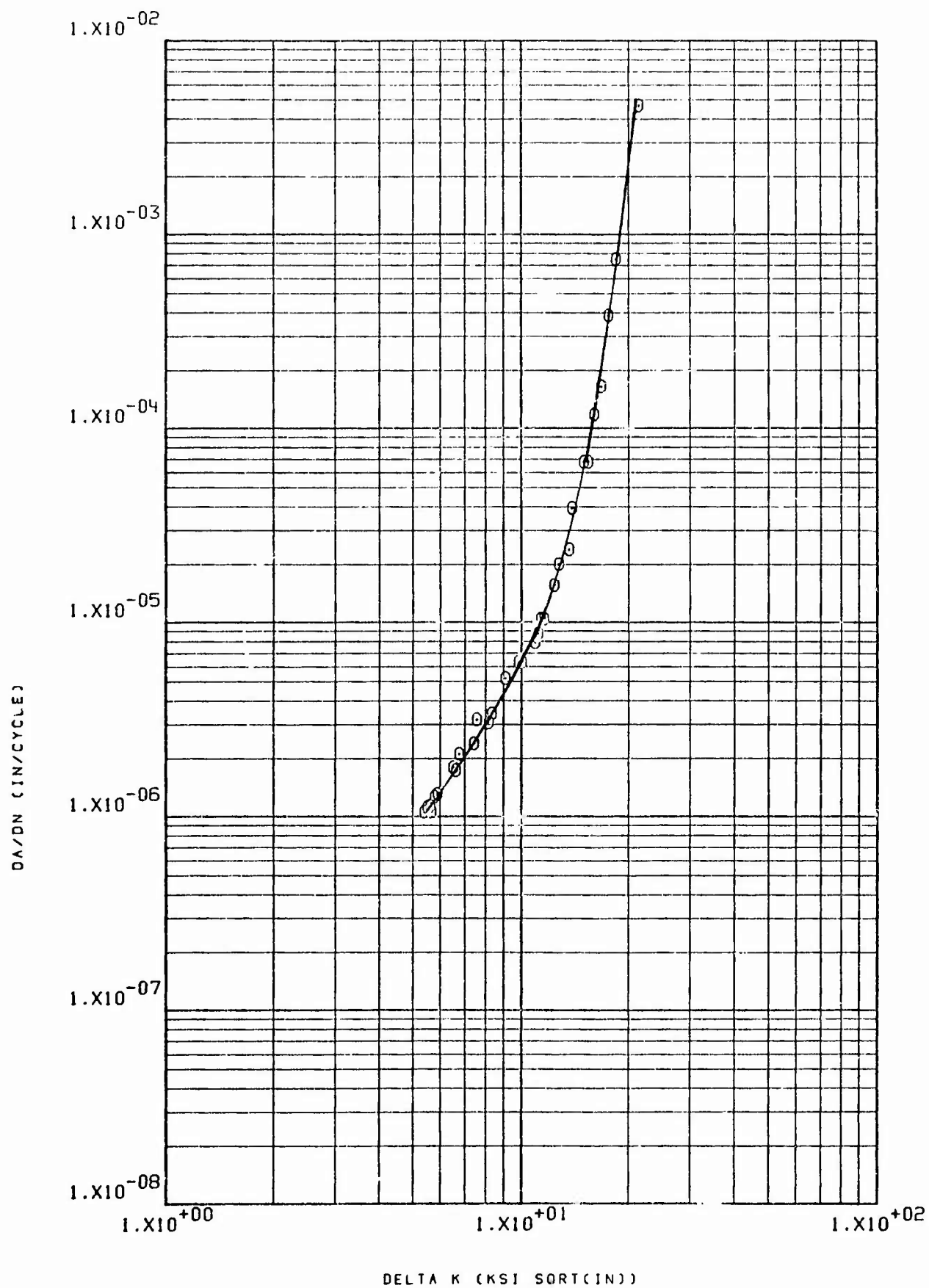


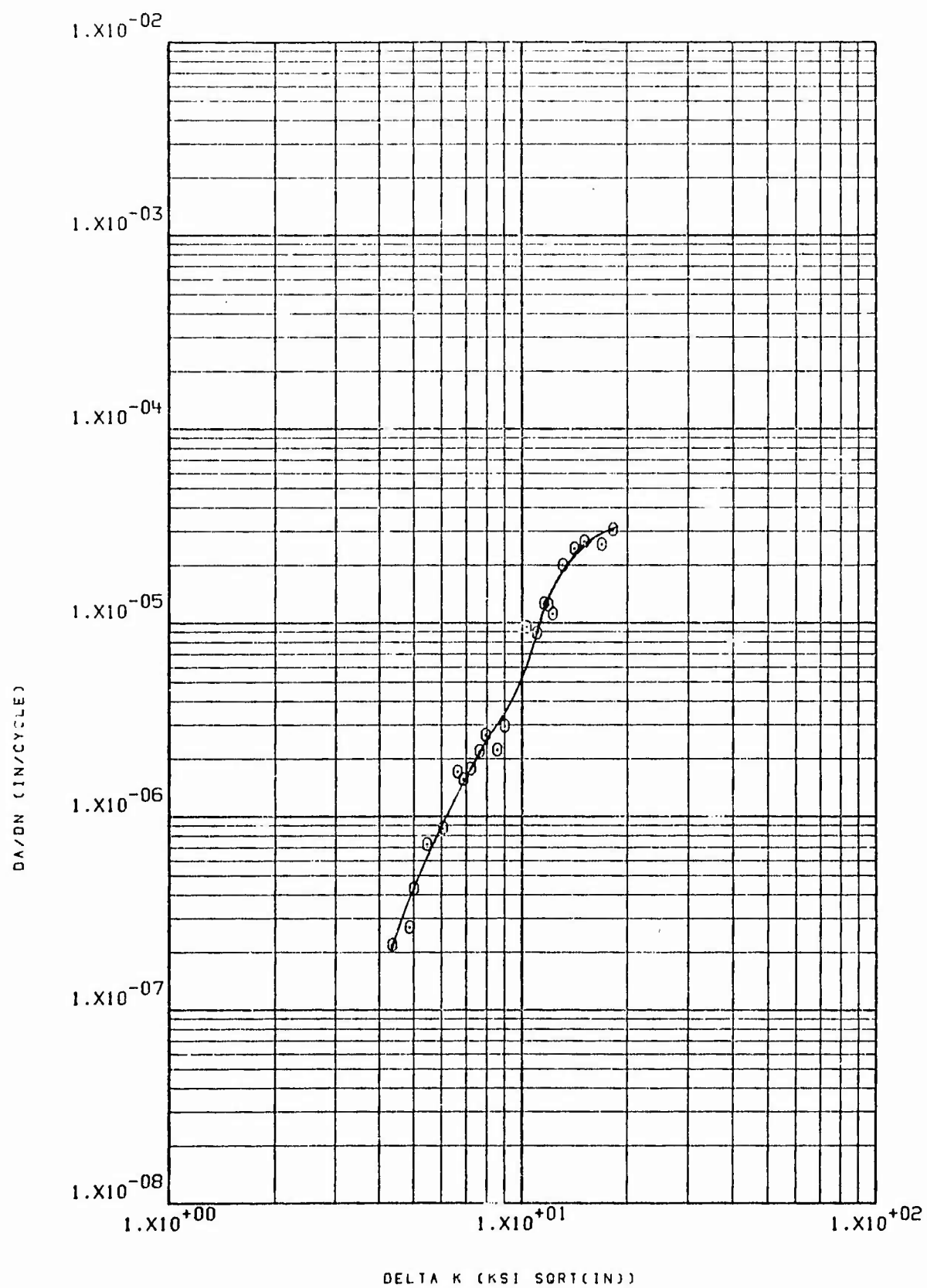
7 NWR 36-11 2219-T851 LHA 265F R=.08 360CPM









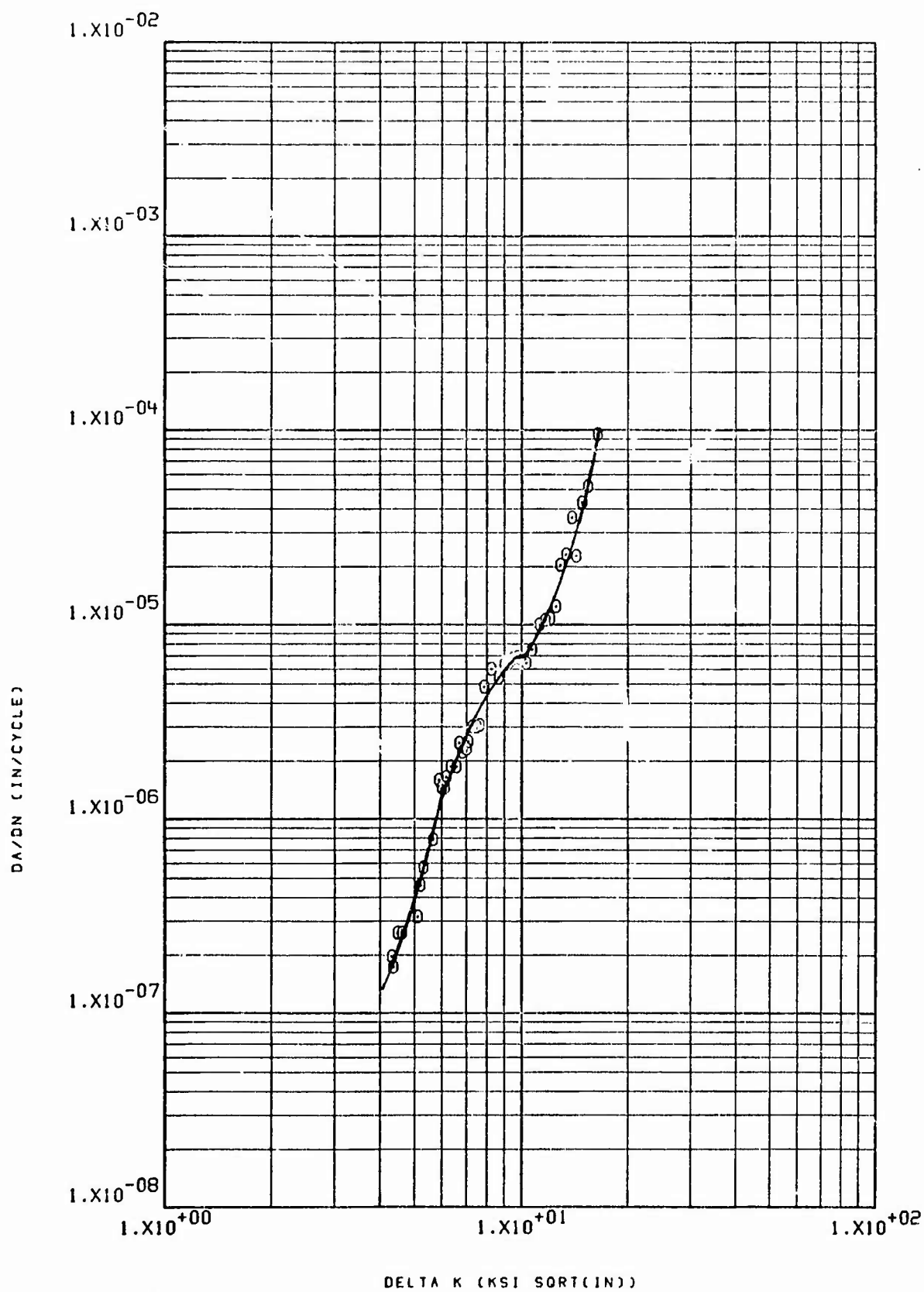


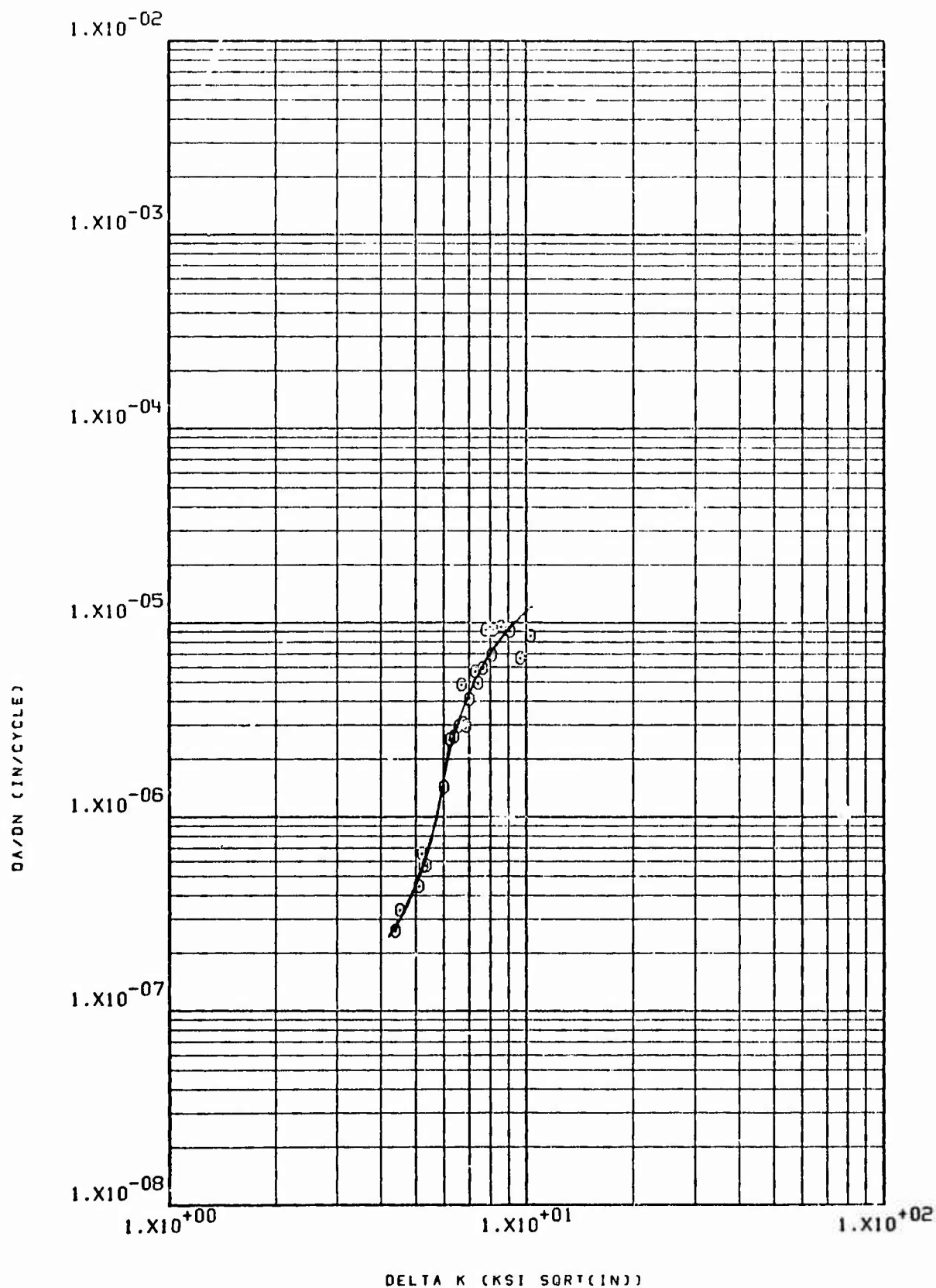
12 NRW 35-48 2124-T851

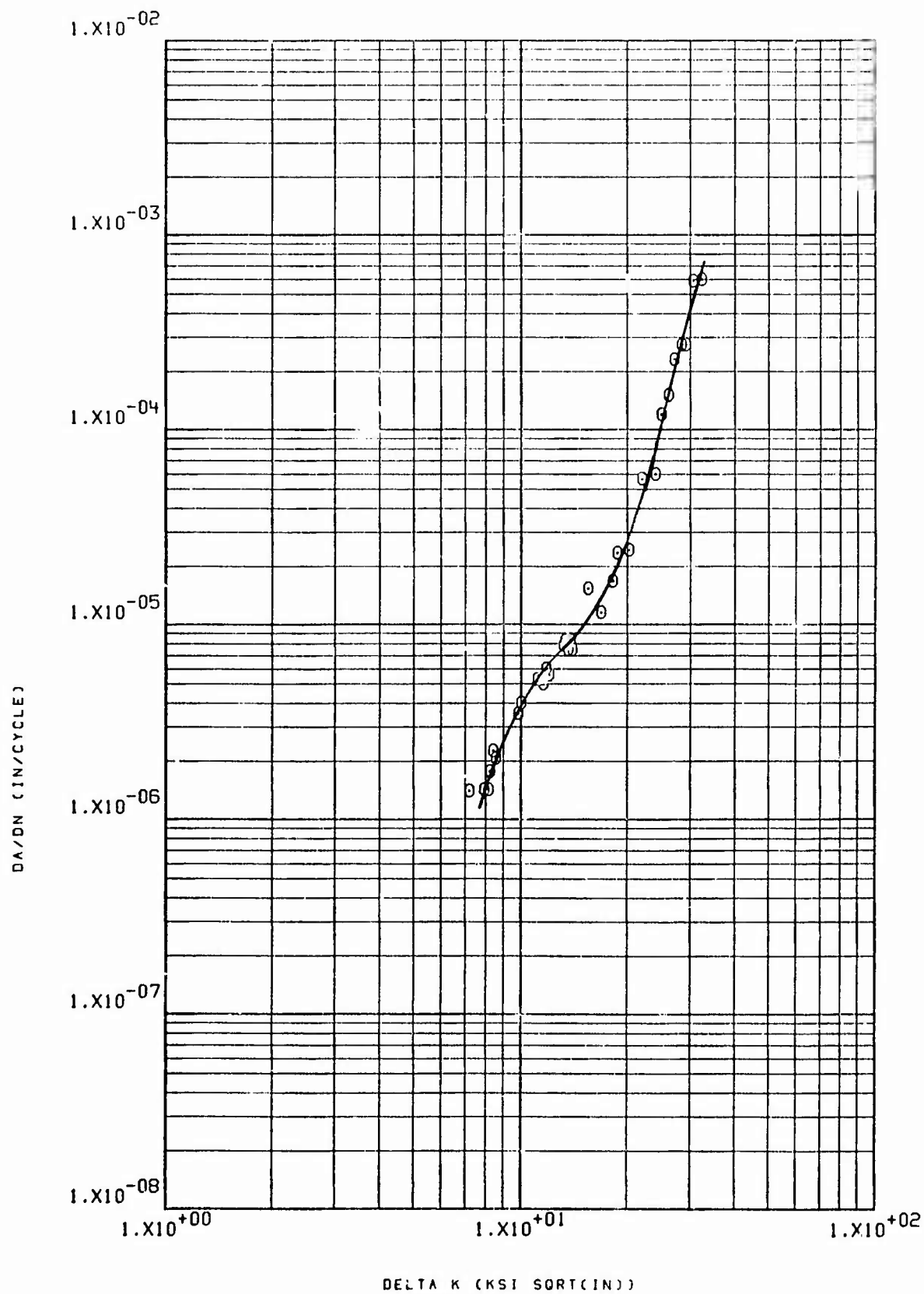
SUMP

R.T. 60CPH R=.08

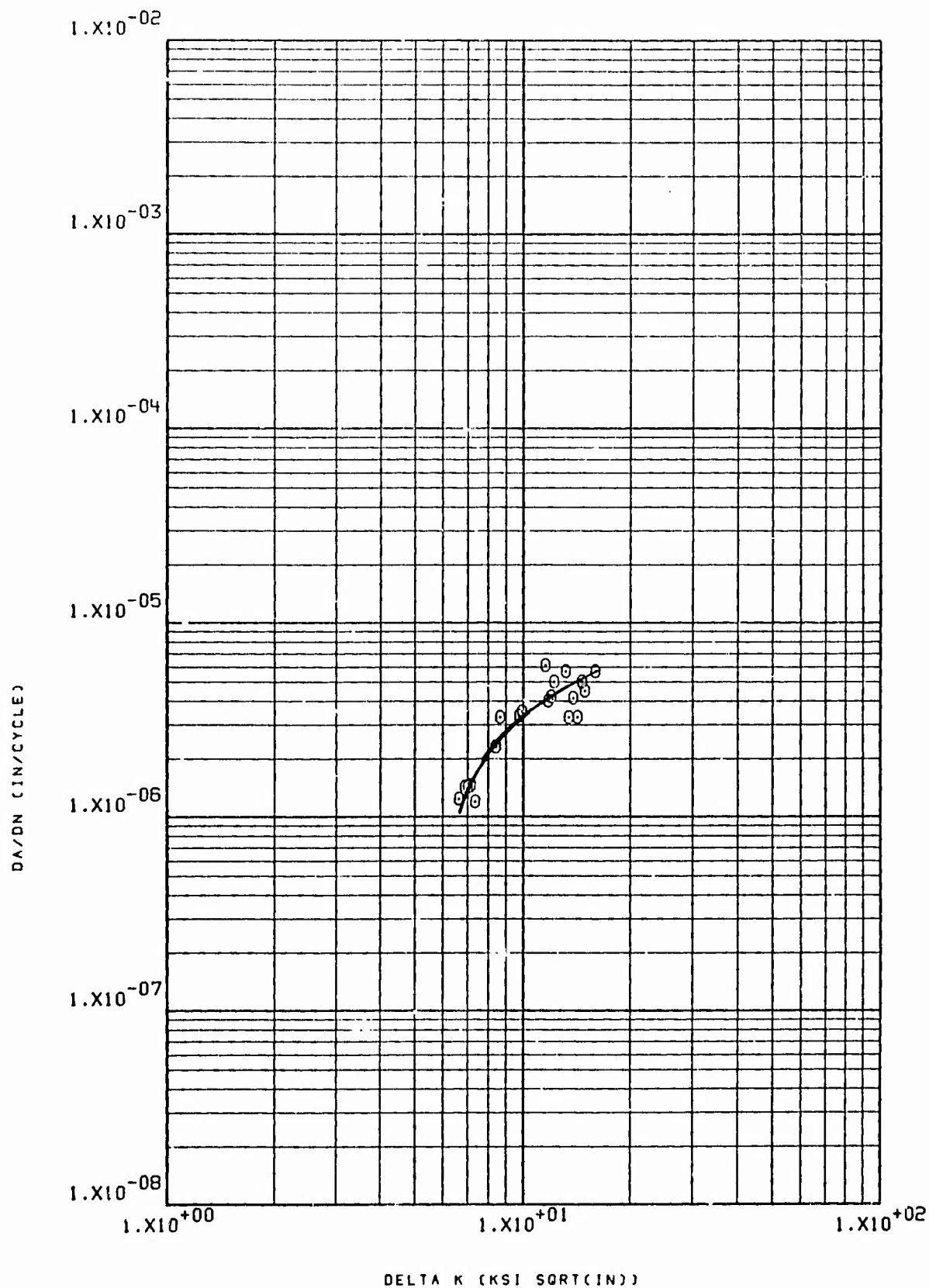
B-57



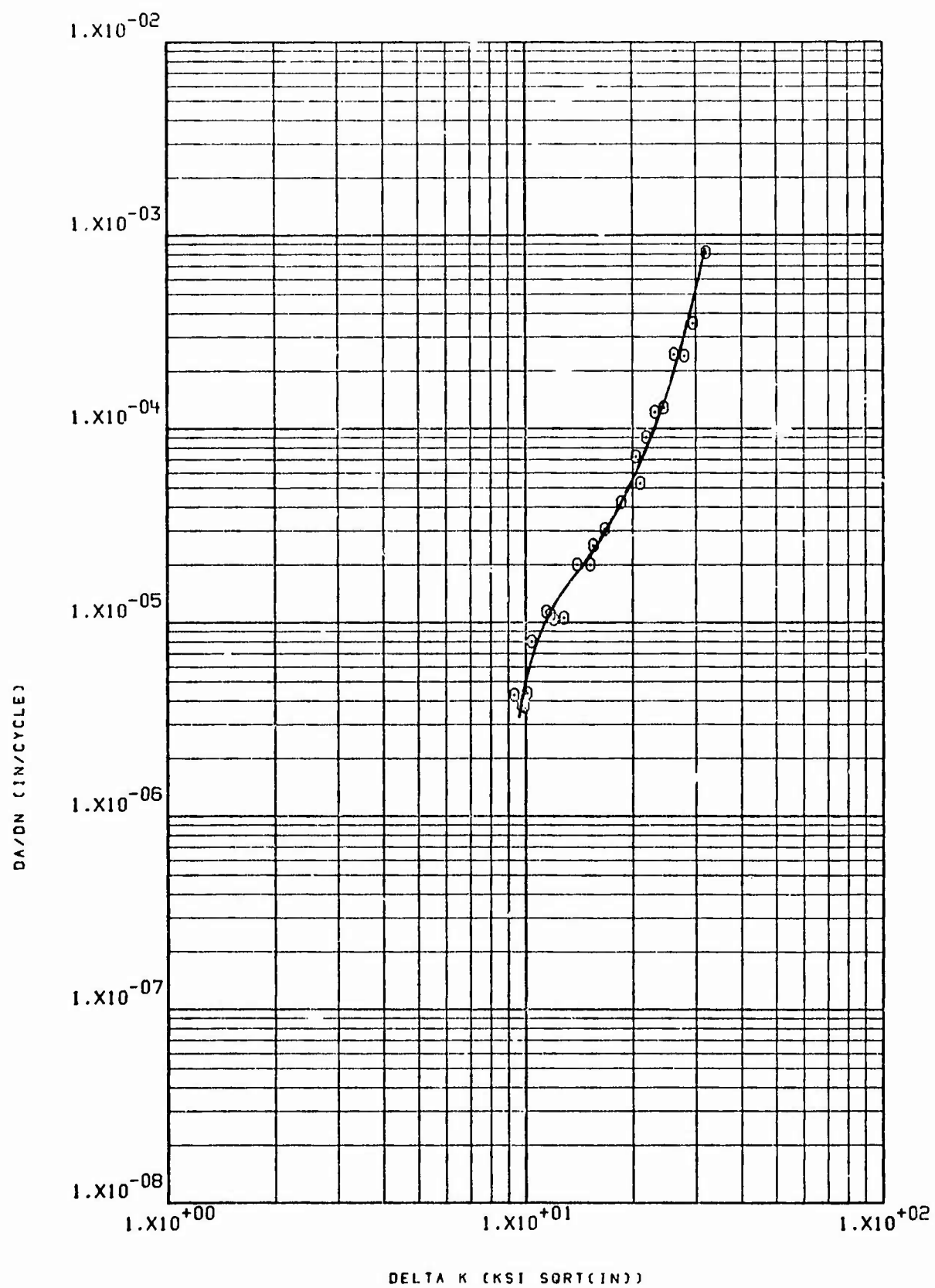


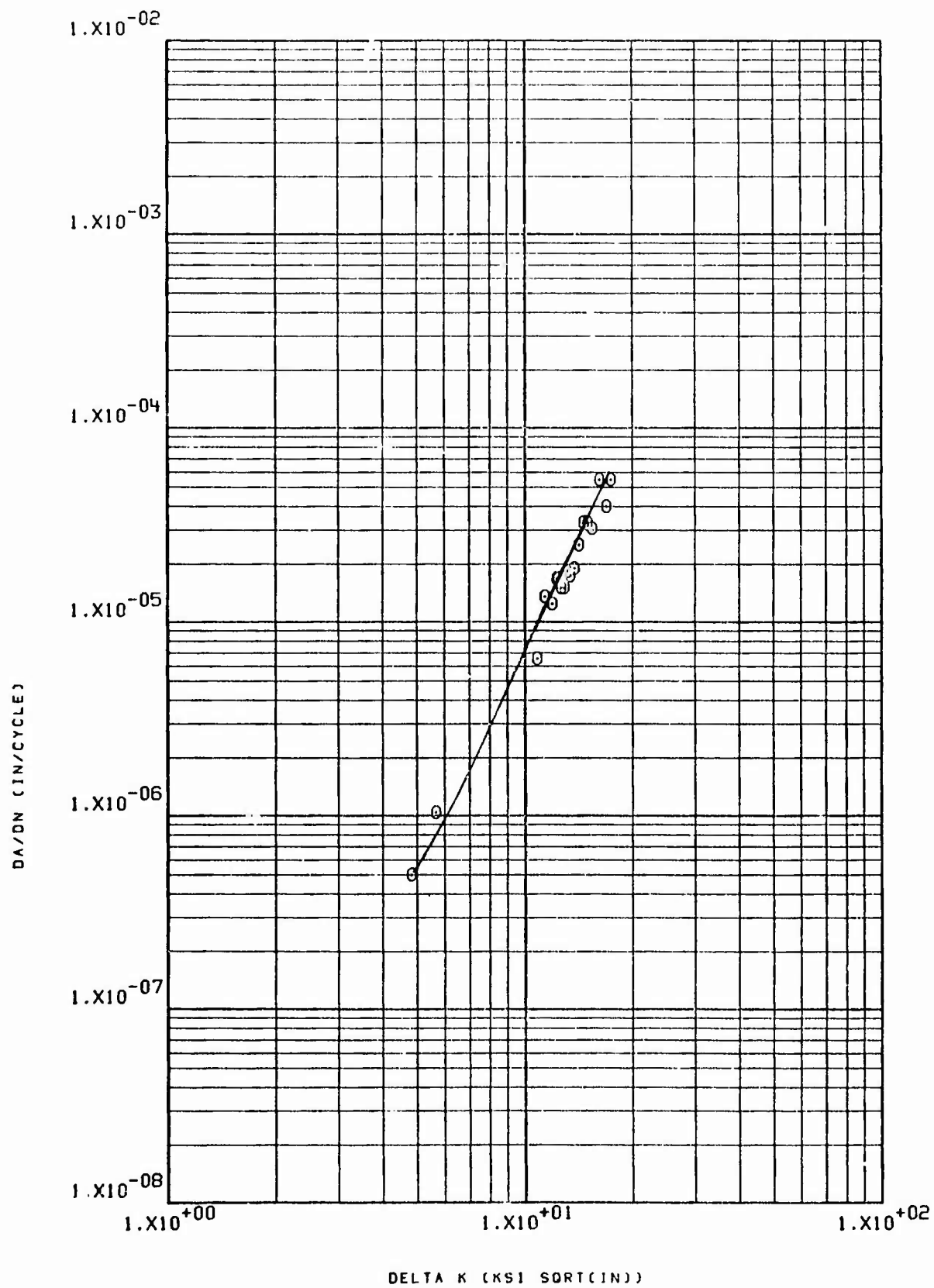


13 NRW 37-12 2219-T851 ALUMINUM LHA RT R=.08 360CPH

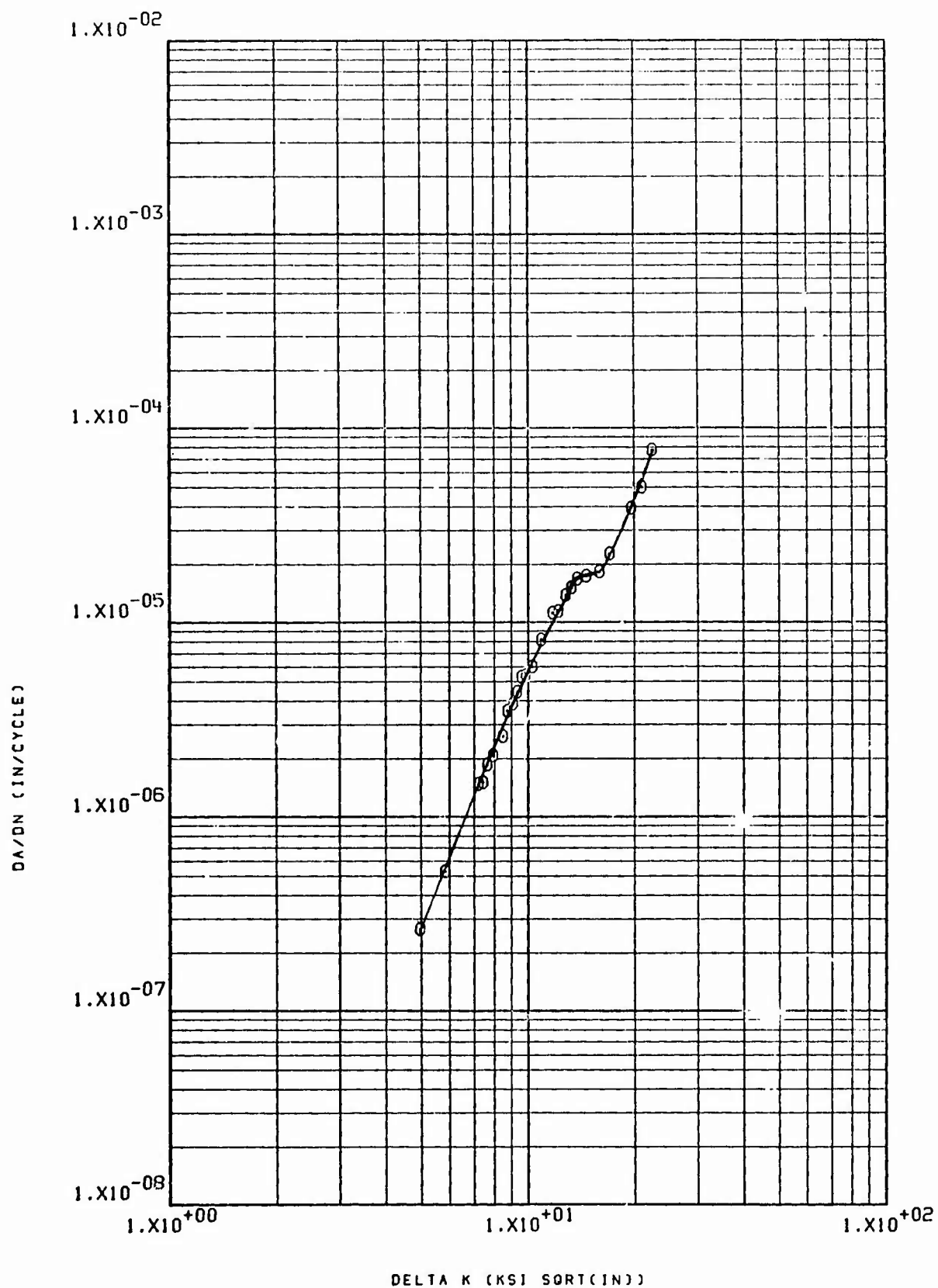


13 NRW 37-13 2219-T-851 LHA 265F 360CPM R=.08

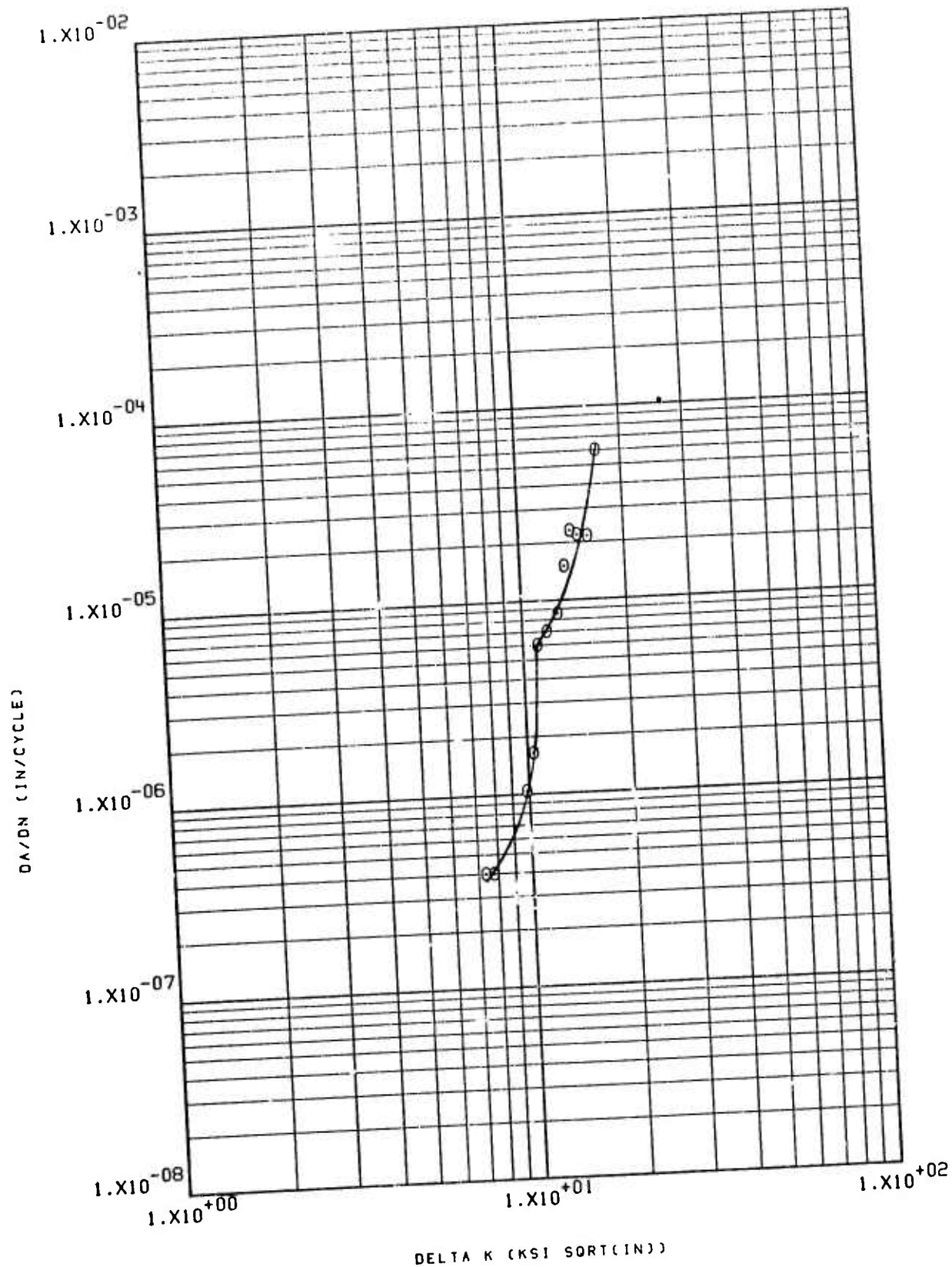




13 NWR 37-15 2219-1851 BUMP RT R=.08 60CPH

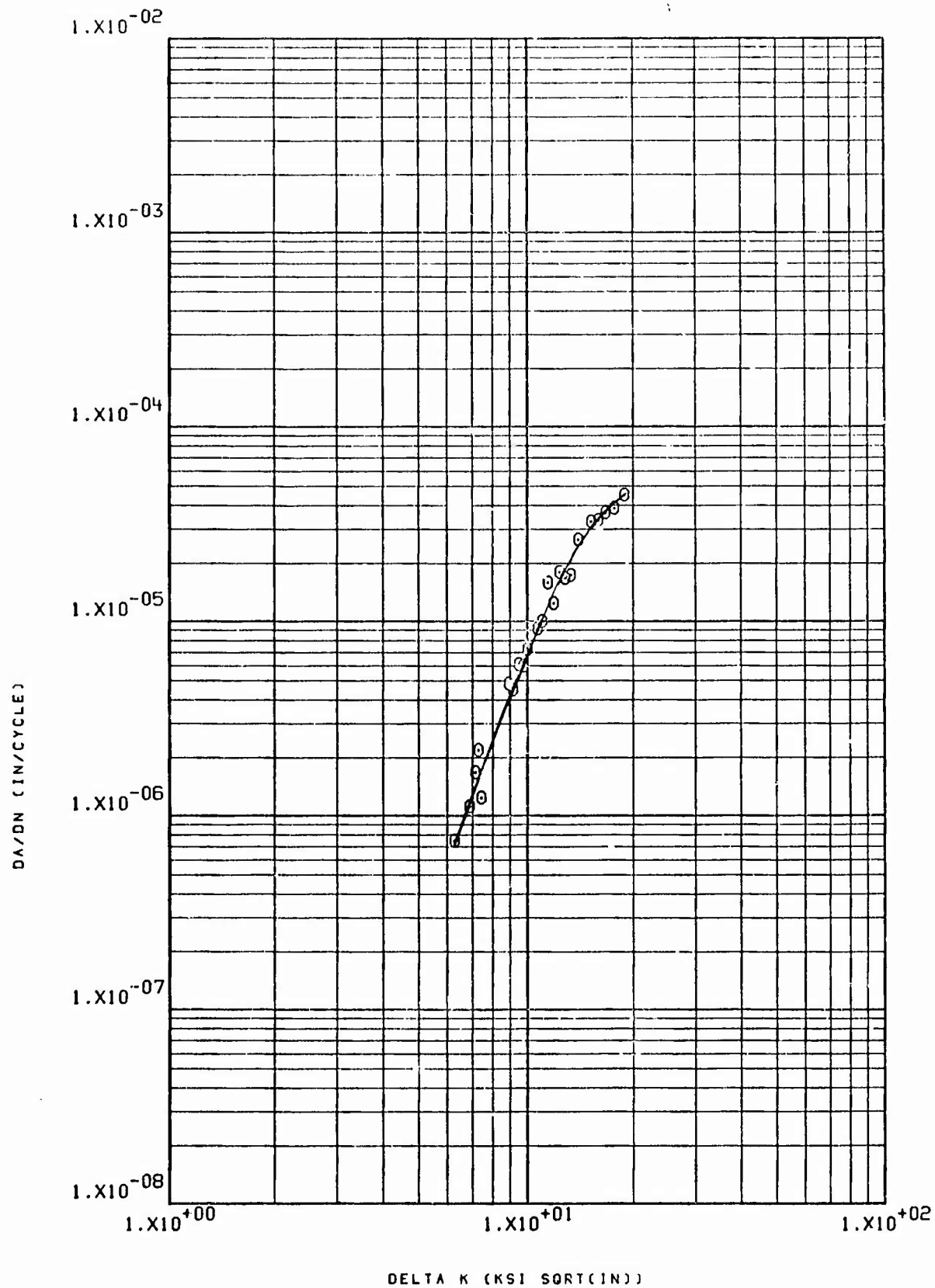


14 NRW 41-12 2124-T851 LHA RT R=.08 360CPM

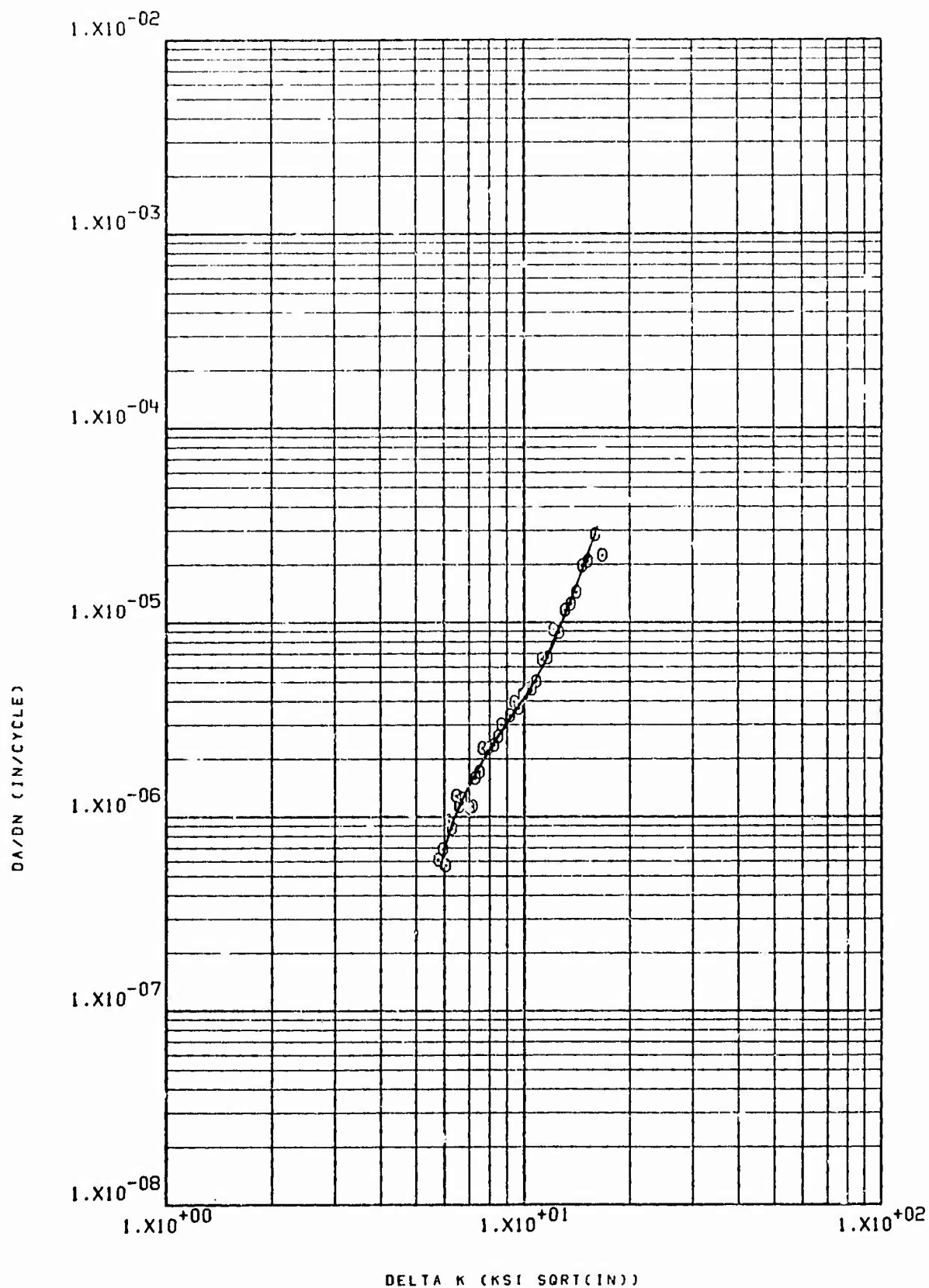


14 NRW 41-13 2124-T851 SUMP WATER RT R=.08 60CPM

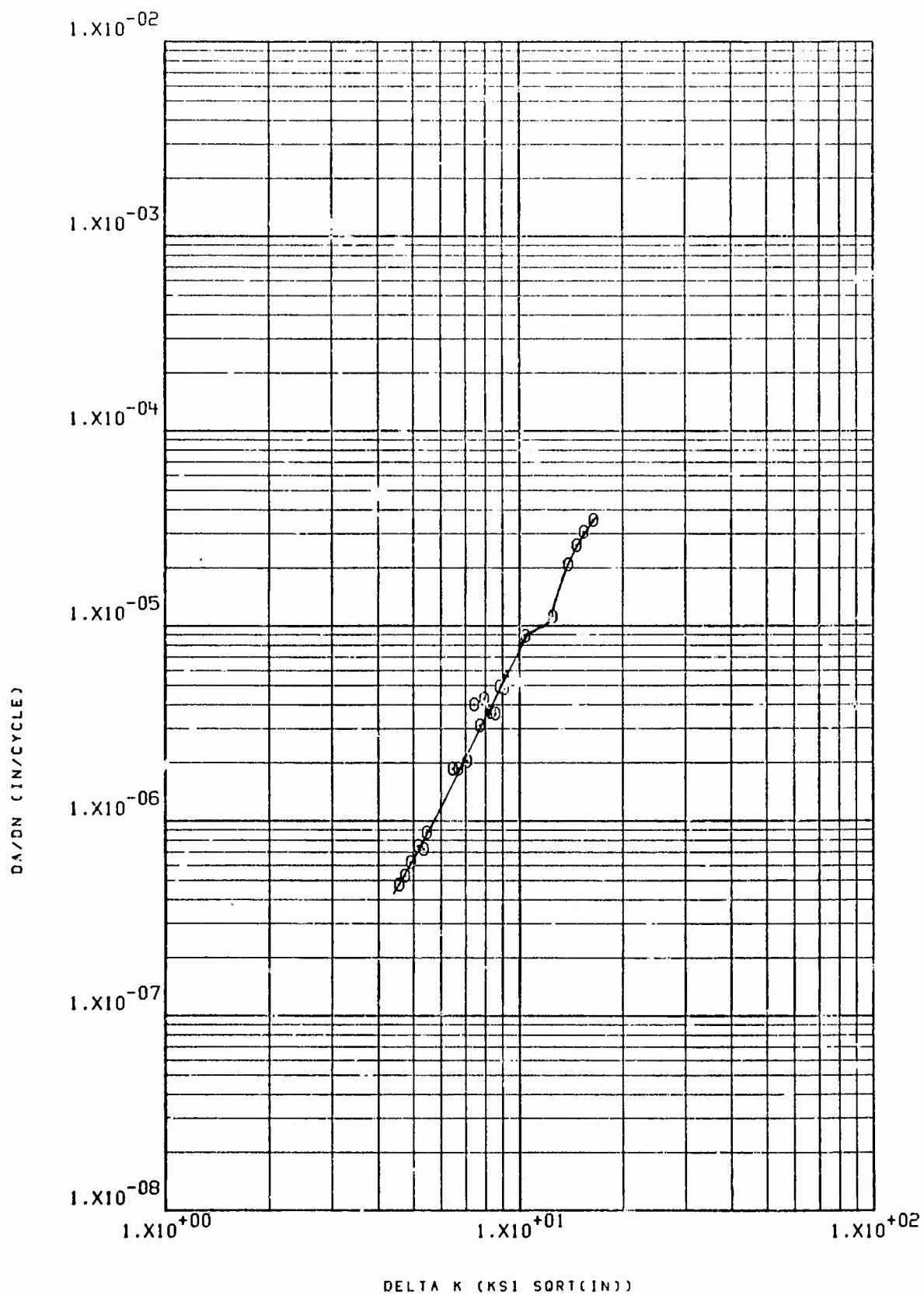
B-65

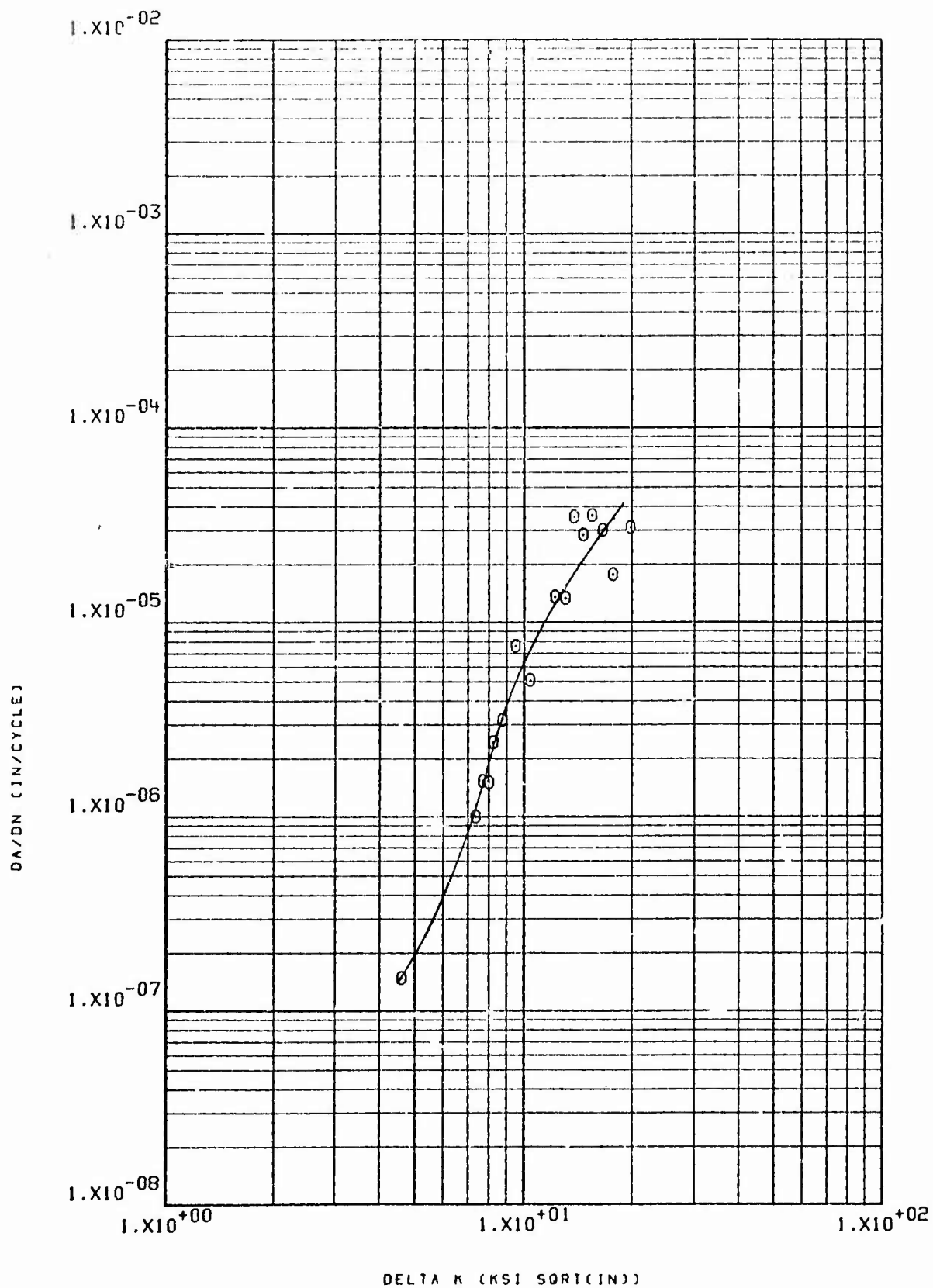


15 NRW 42-15 7075-1765! ALUM LHA RT R=.08 360CPM



16 NWR 48-1 2219-T8511 L.H.A. EXTR. R.T. 360CPM R=.08

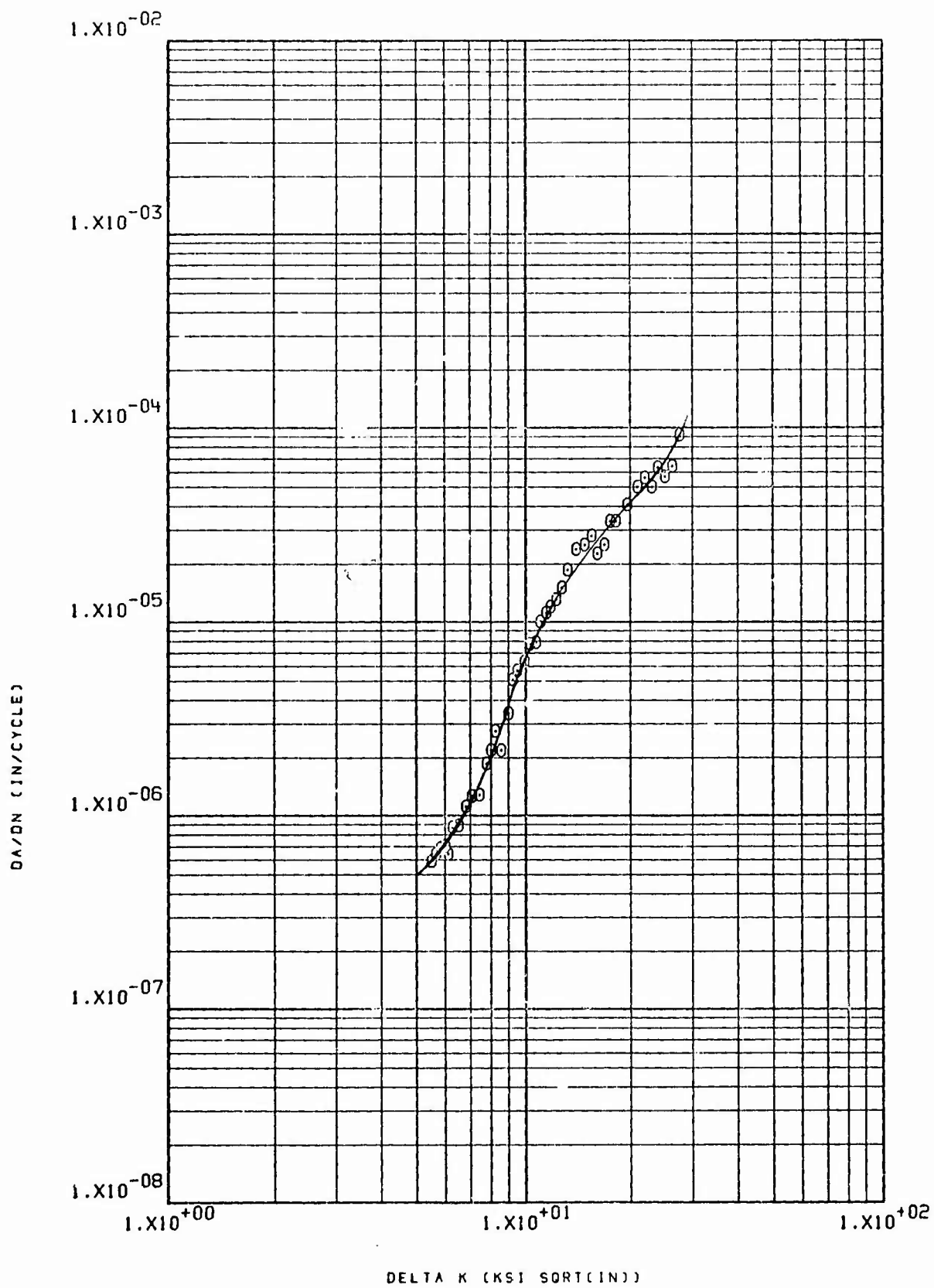




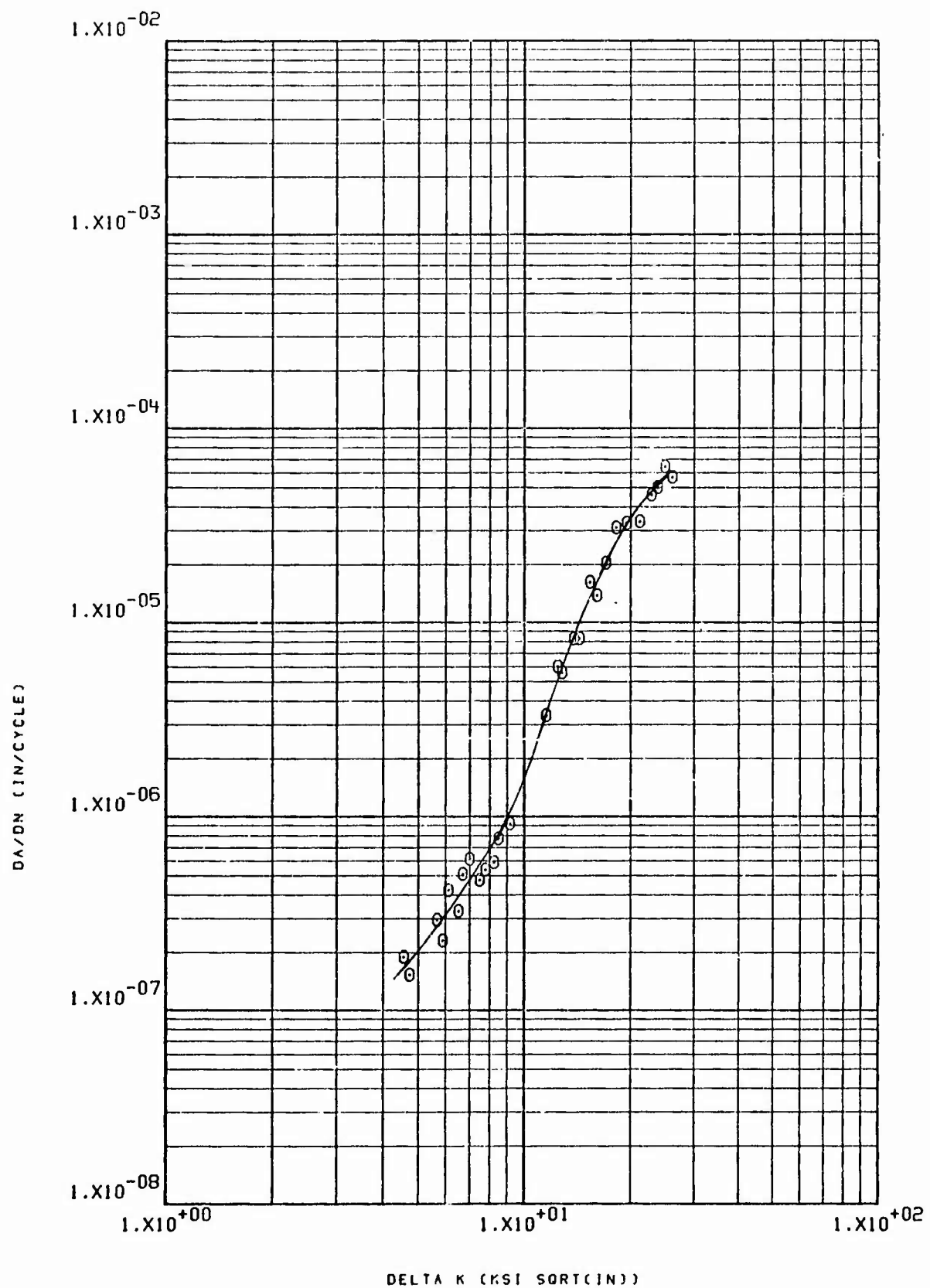
16 HRW 48-3 2219-T8511 EXTR. SUMP

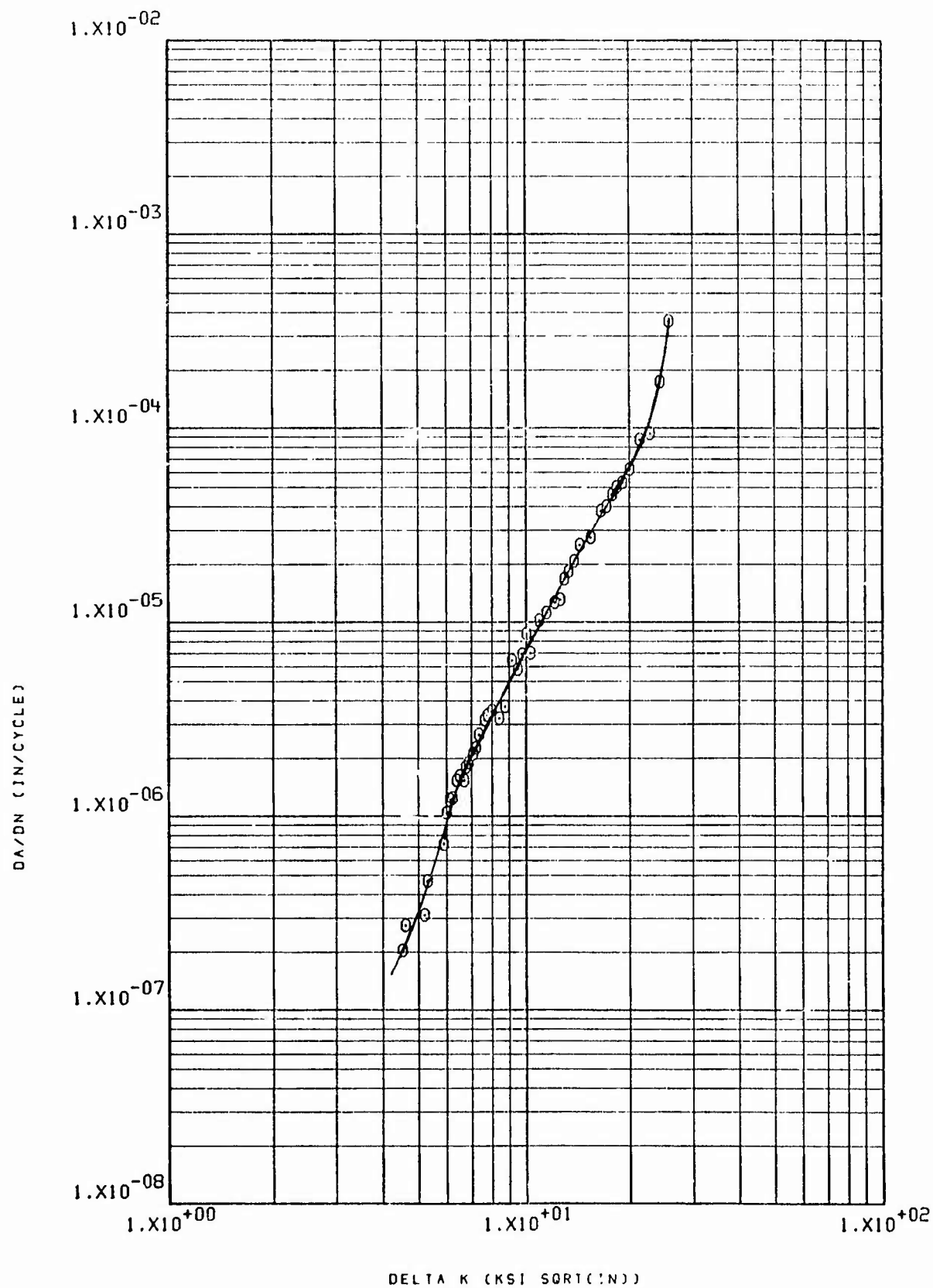
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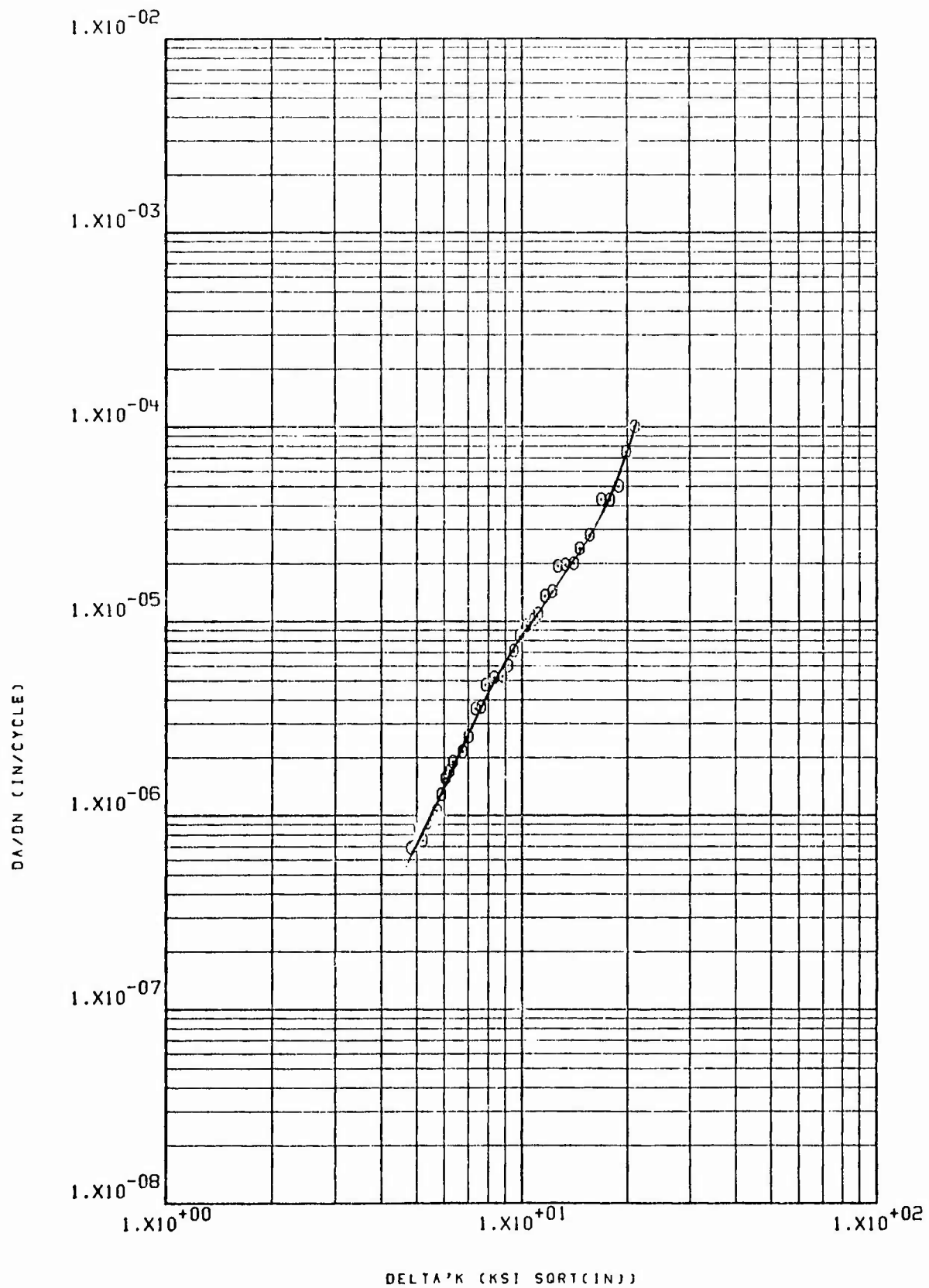
B-69

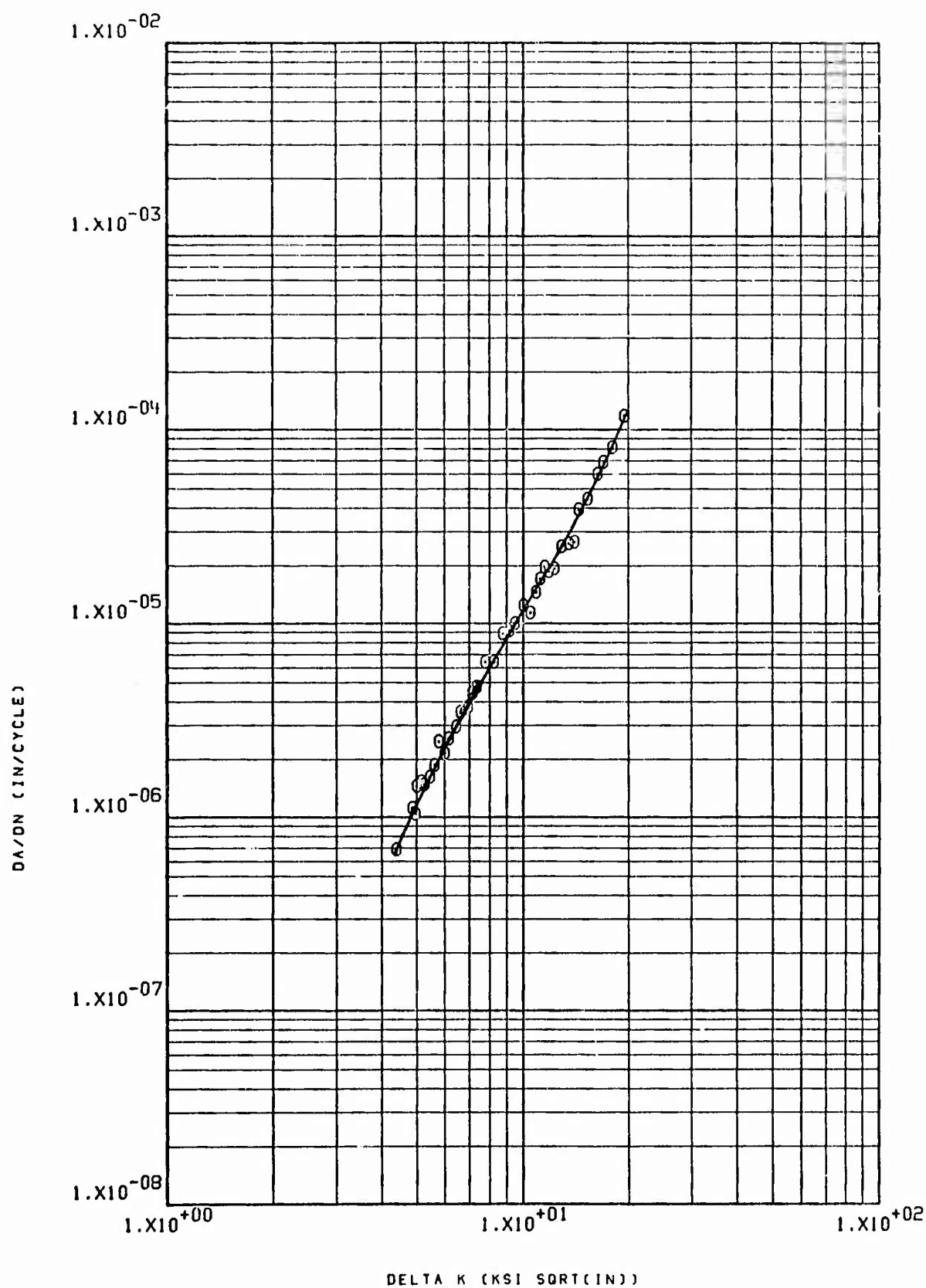


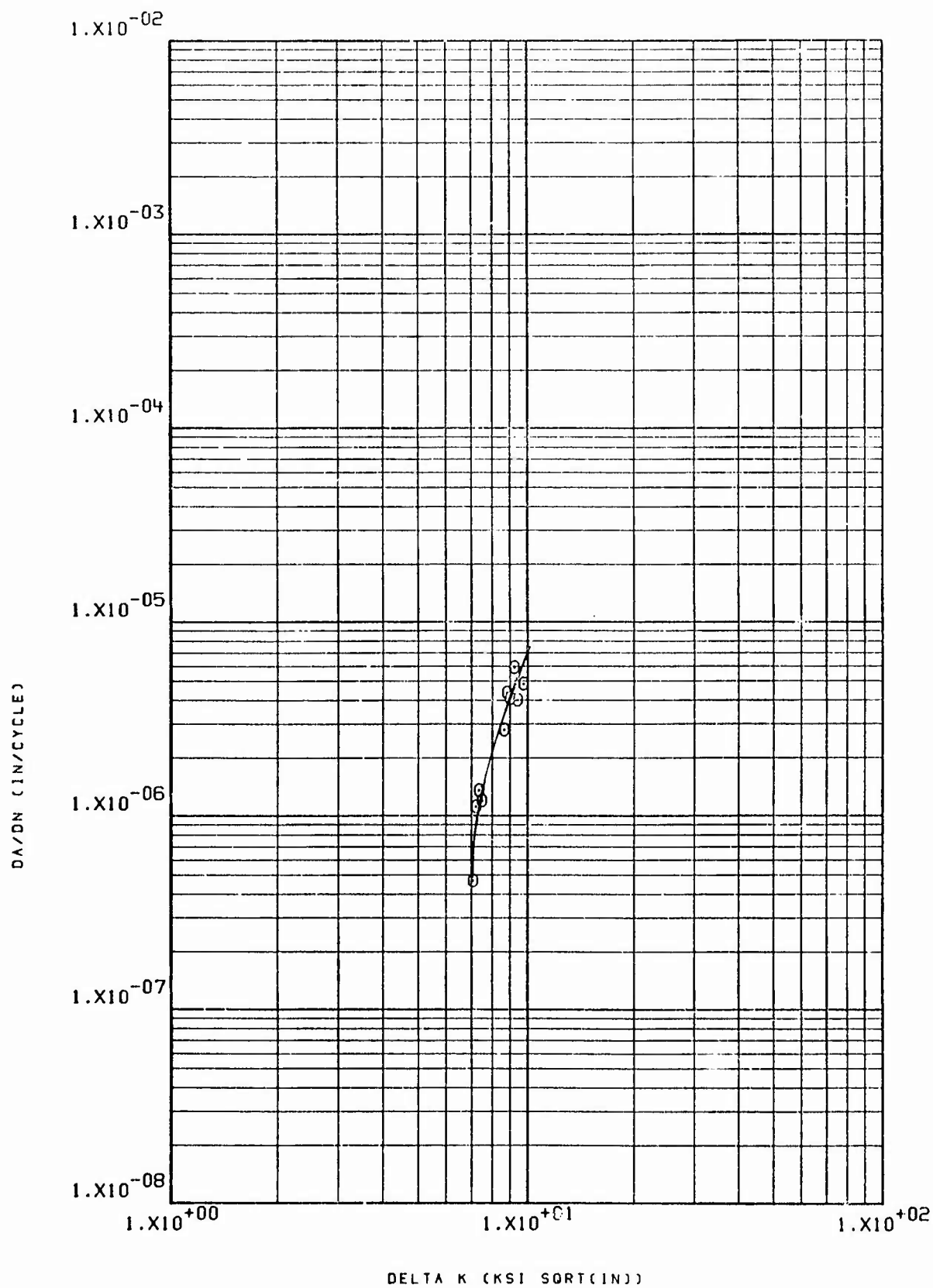
16 NRW 48-4 2219-T8511 EXTR. L.H.A. R.T. 360CPM R=.30

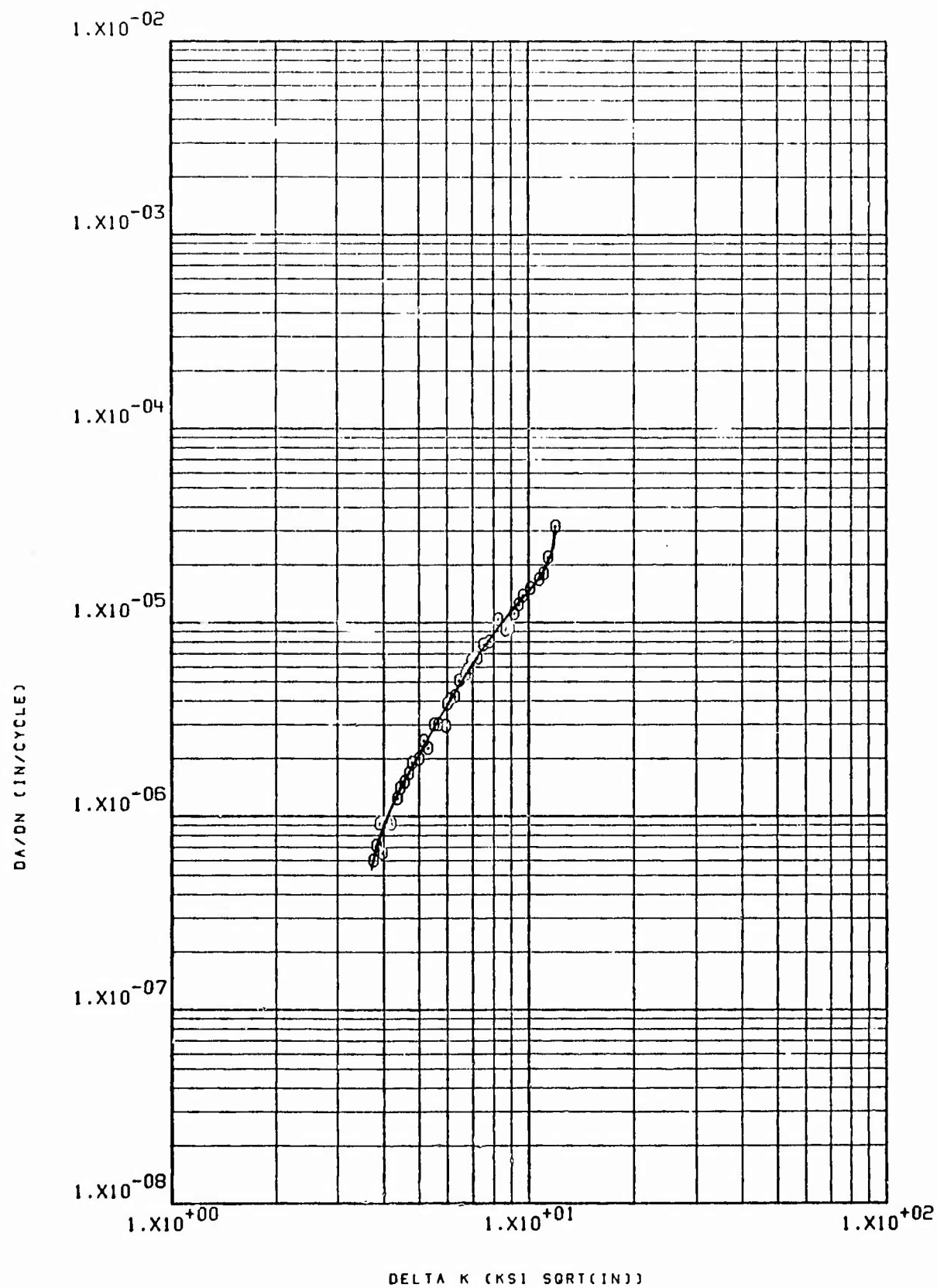


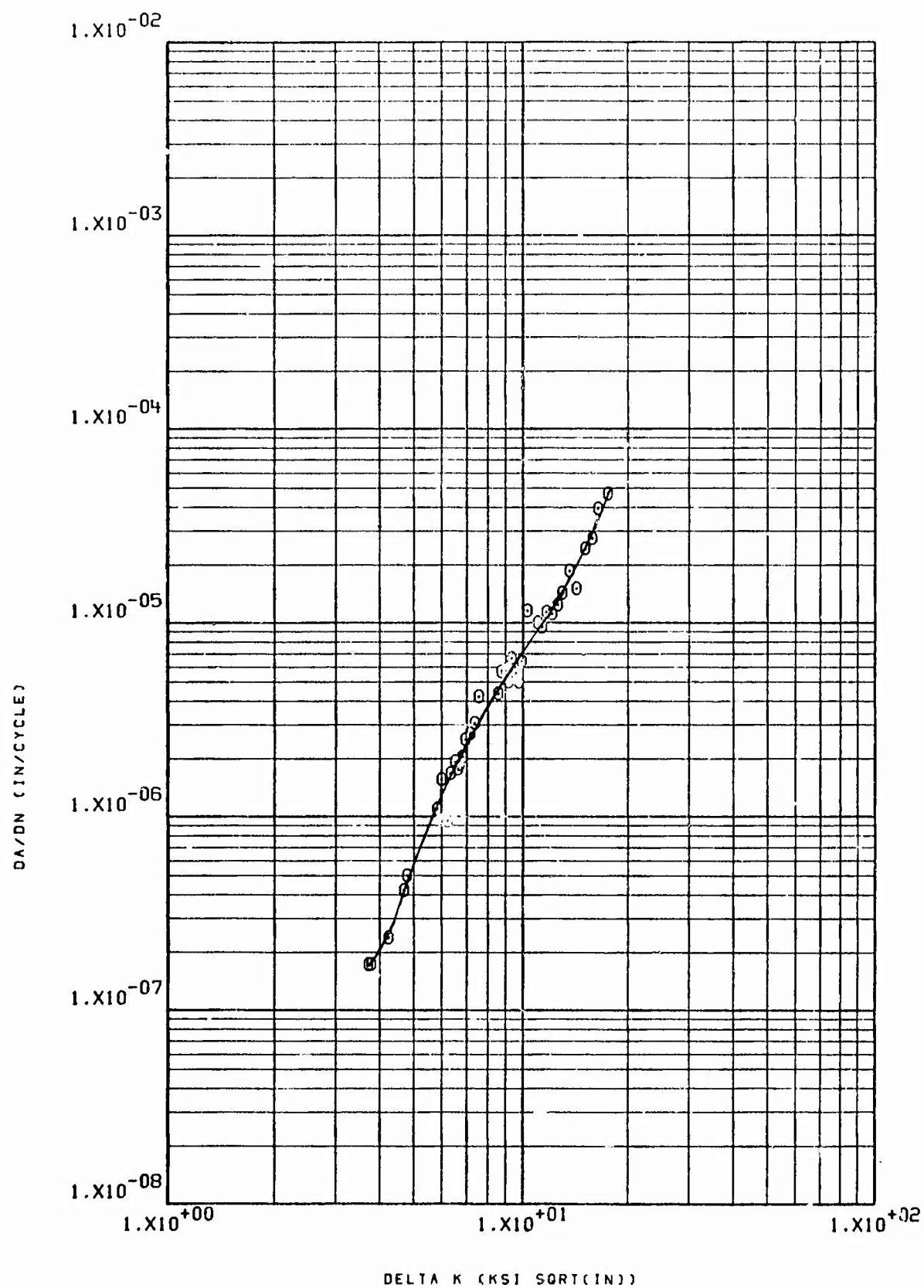




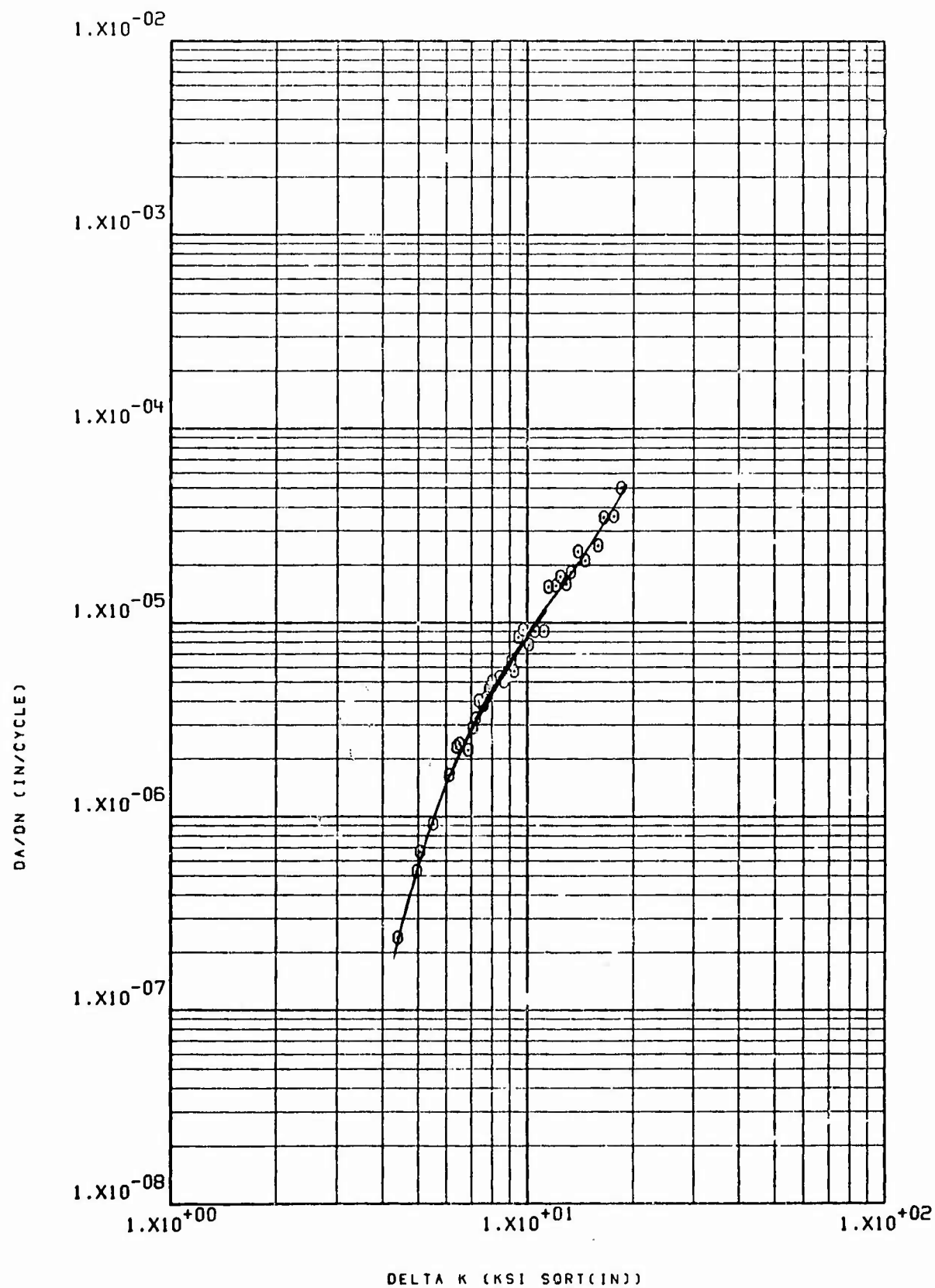




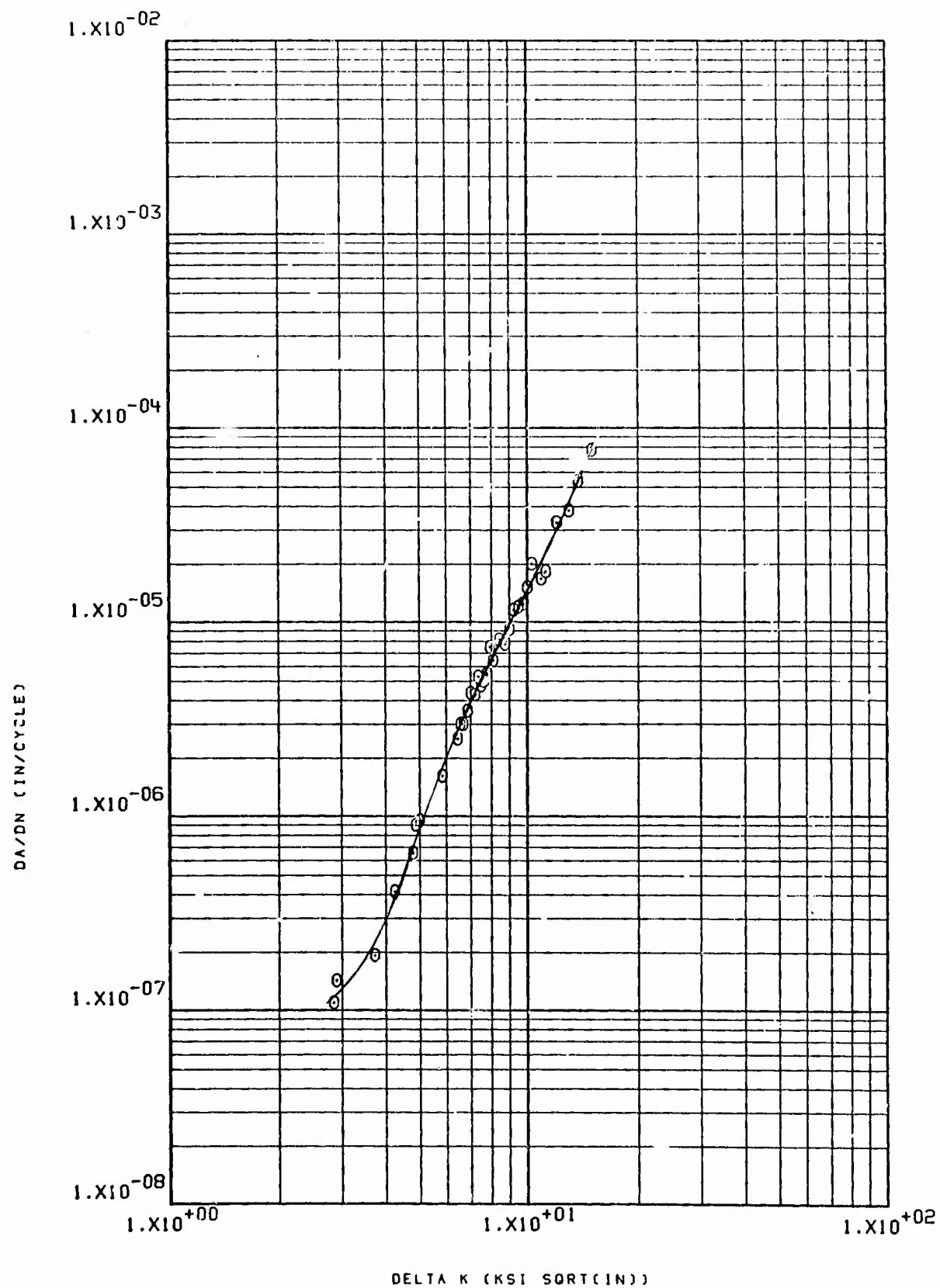


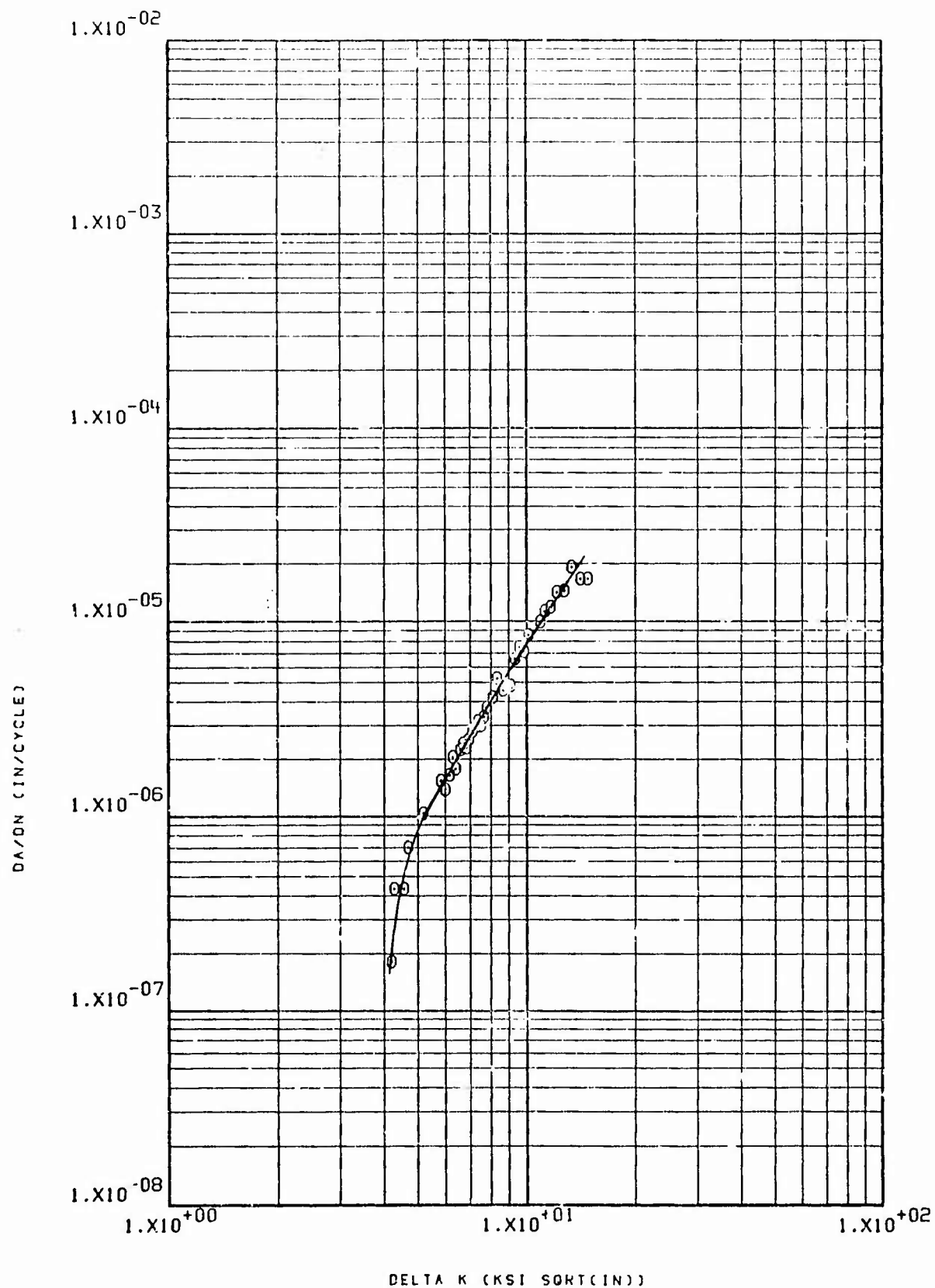


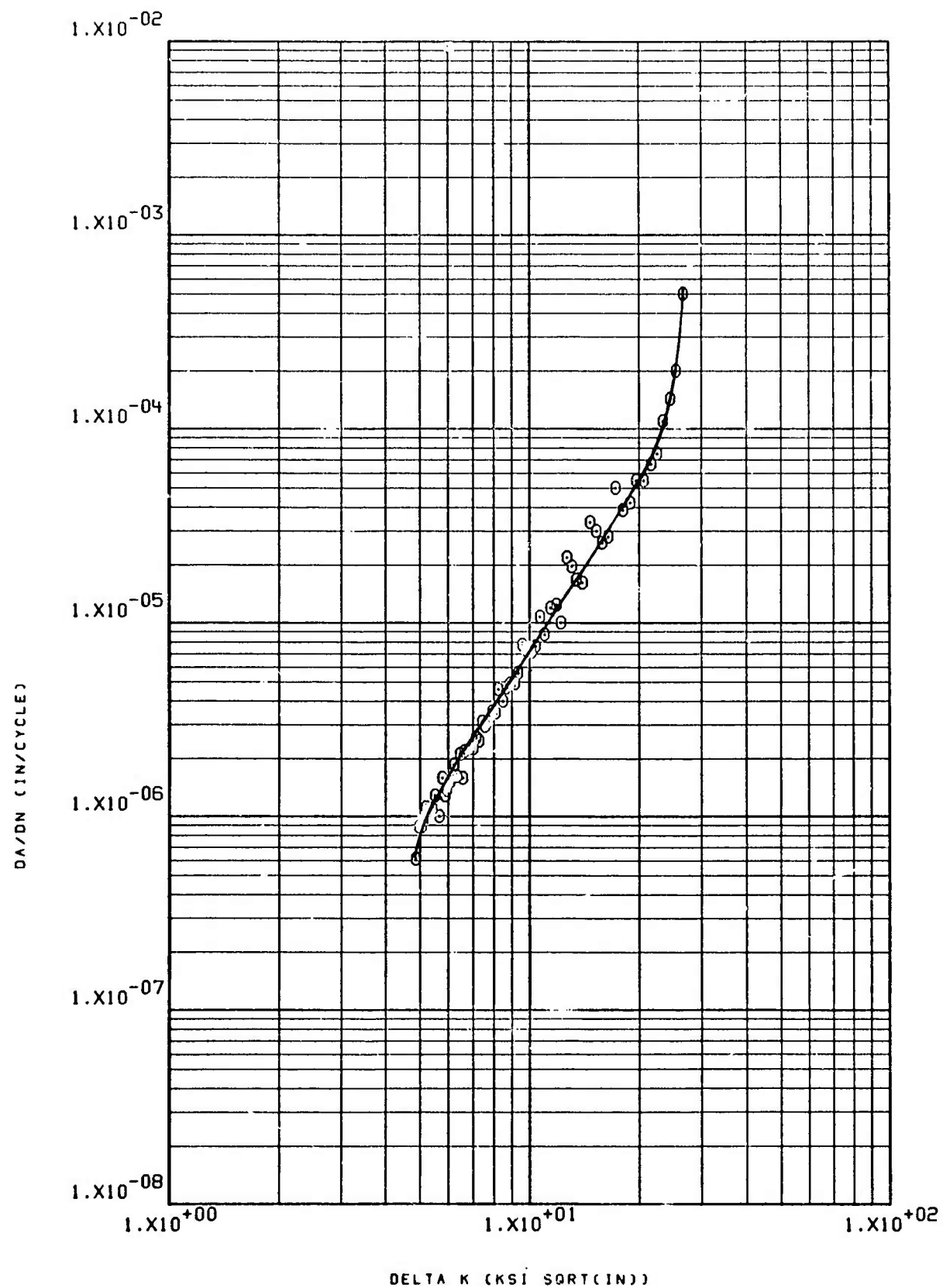
18 NRW 51-7 7075-T7651 LHA RT R=.3 360CPM



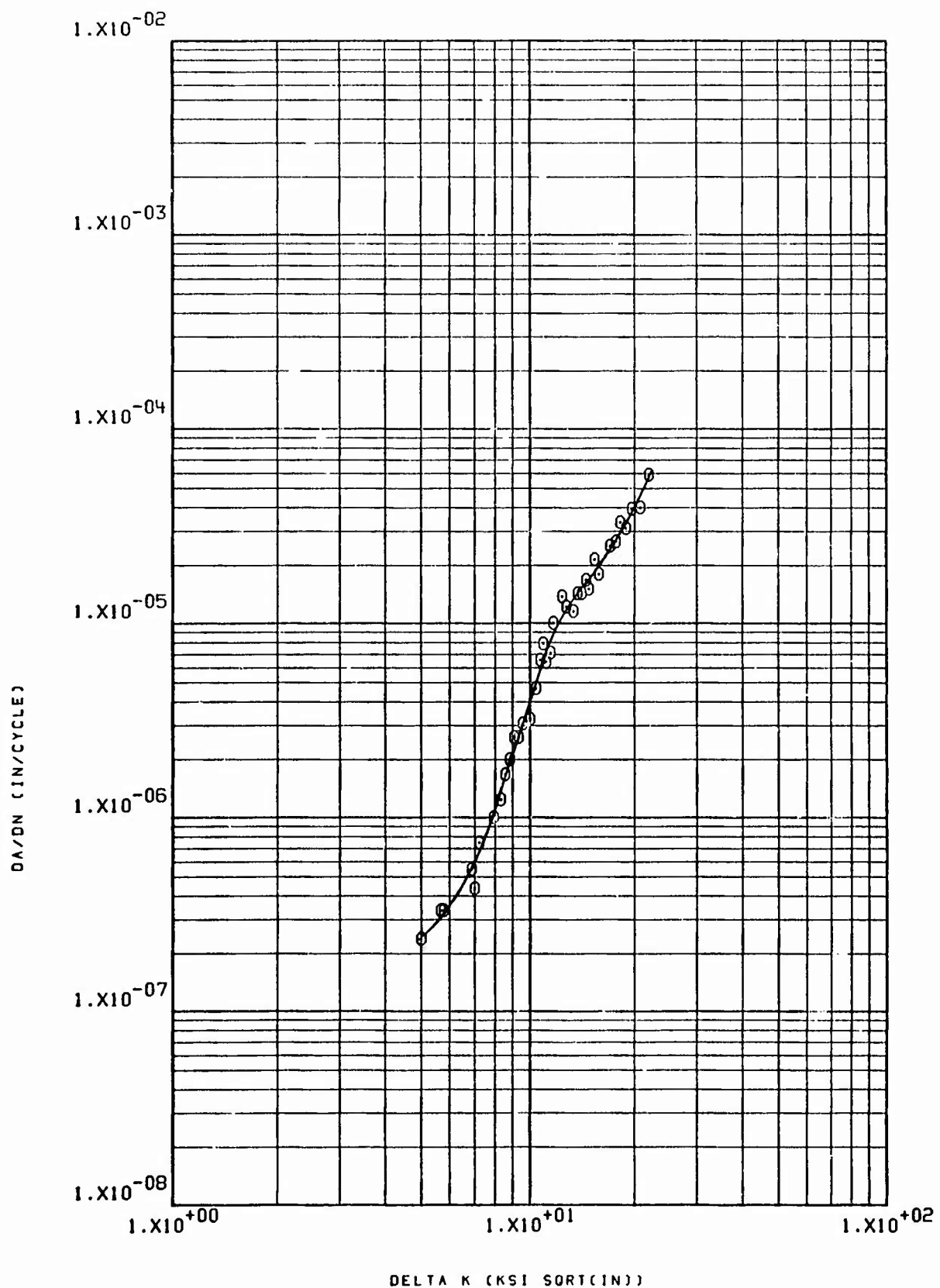
18NRW 51-8 7075-17651 SHOPCLNG SOLV RT R=.08 60CPM







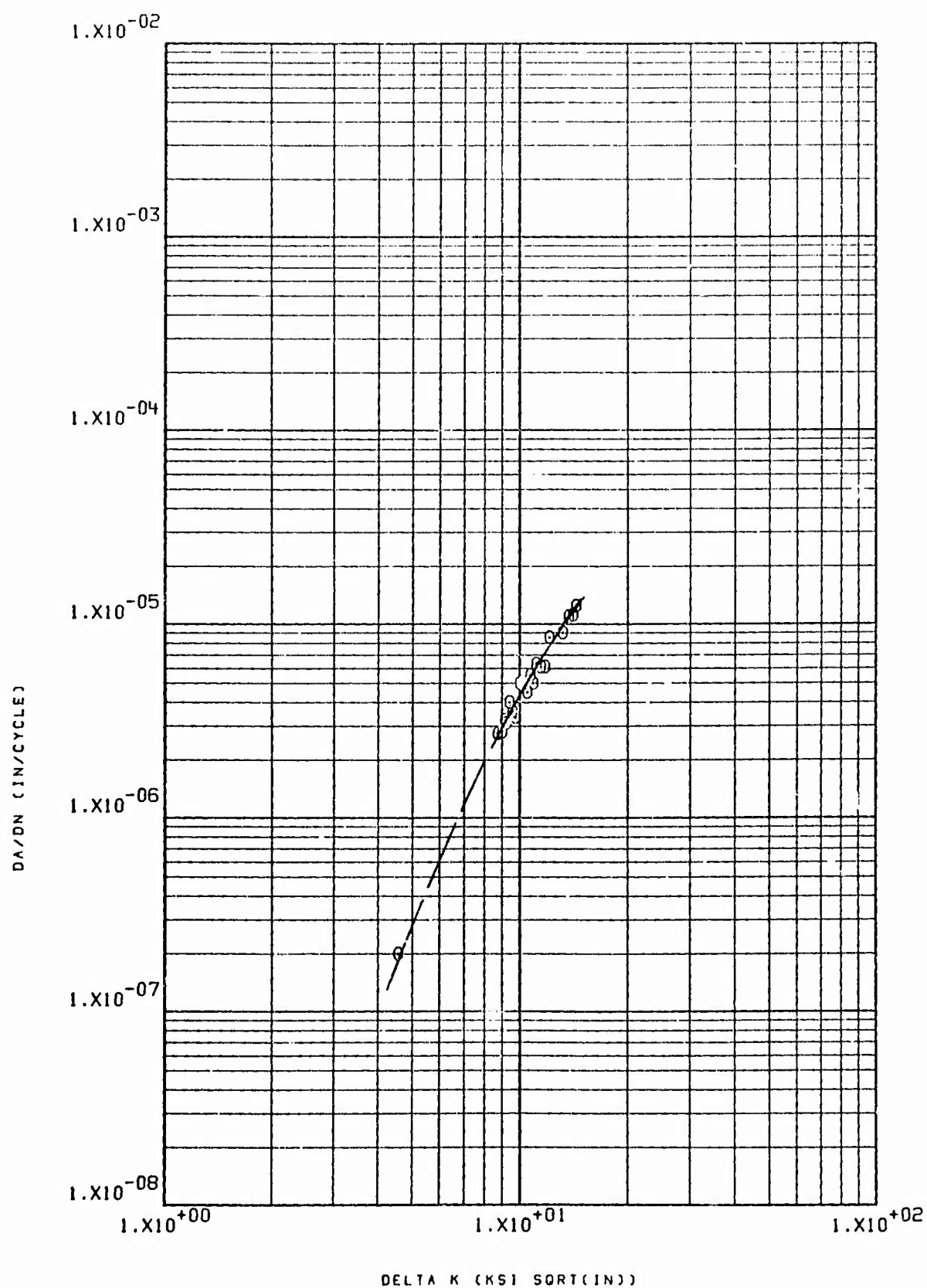
18 NRW 51-12 7075-T7651 LHA 265F R=.08 60 CPM

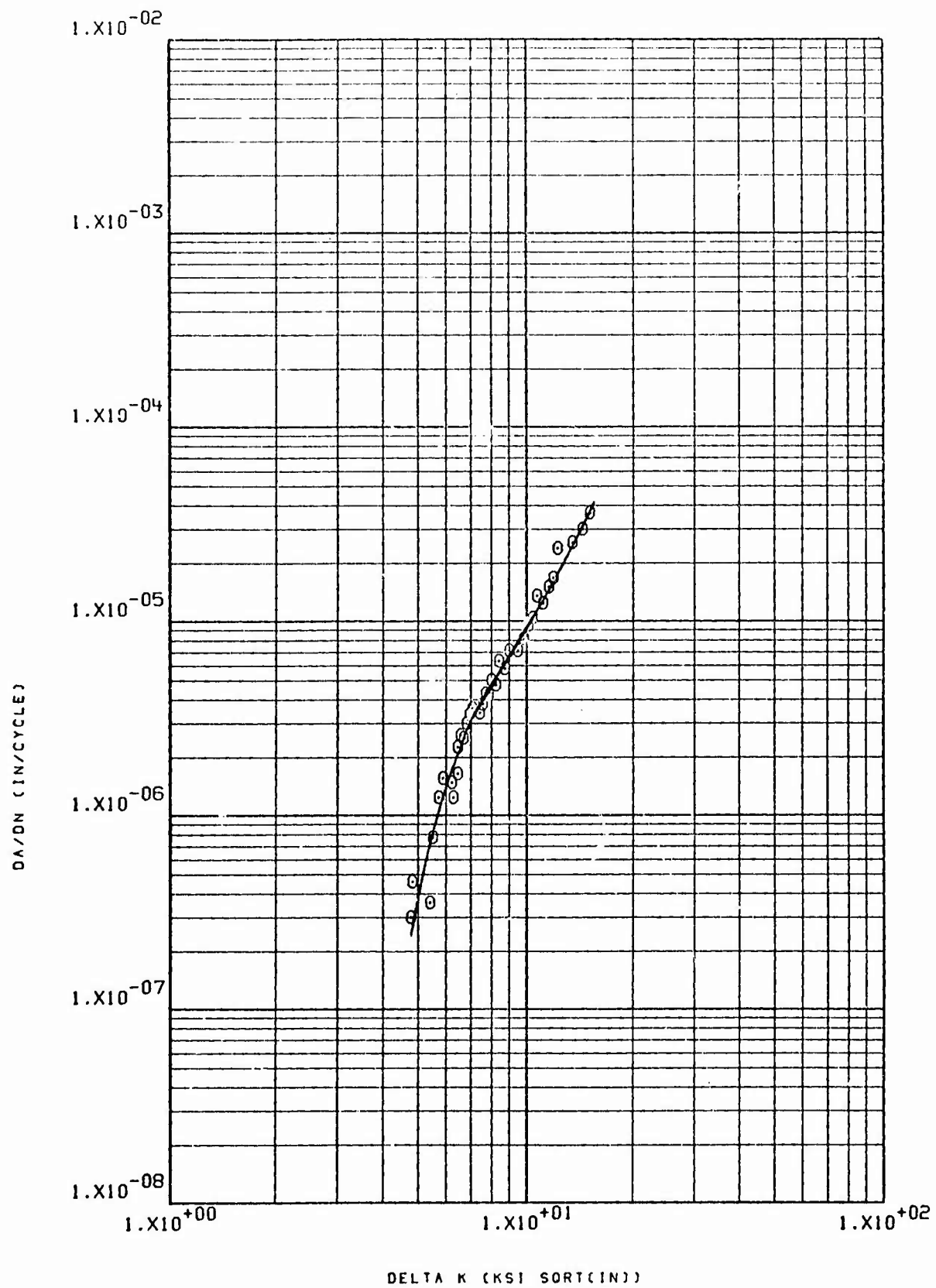


18 NRW 51-13 7075-T7651

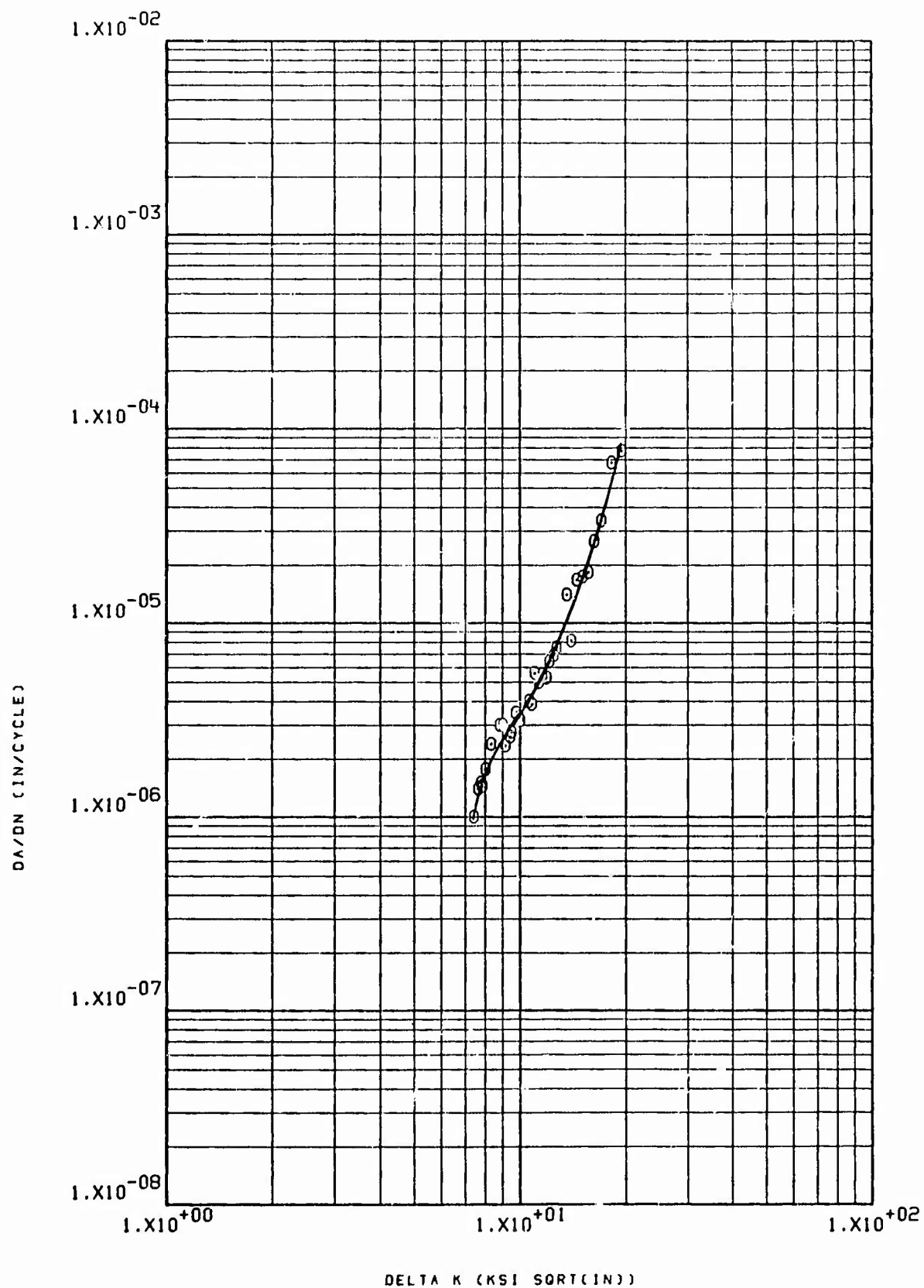
L.H.A.

R.T. 360CPM R=.08

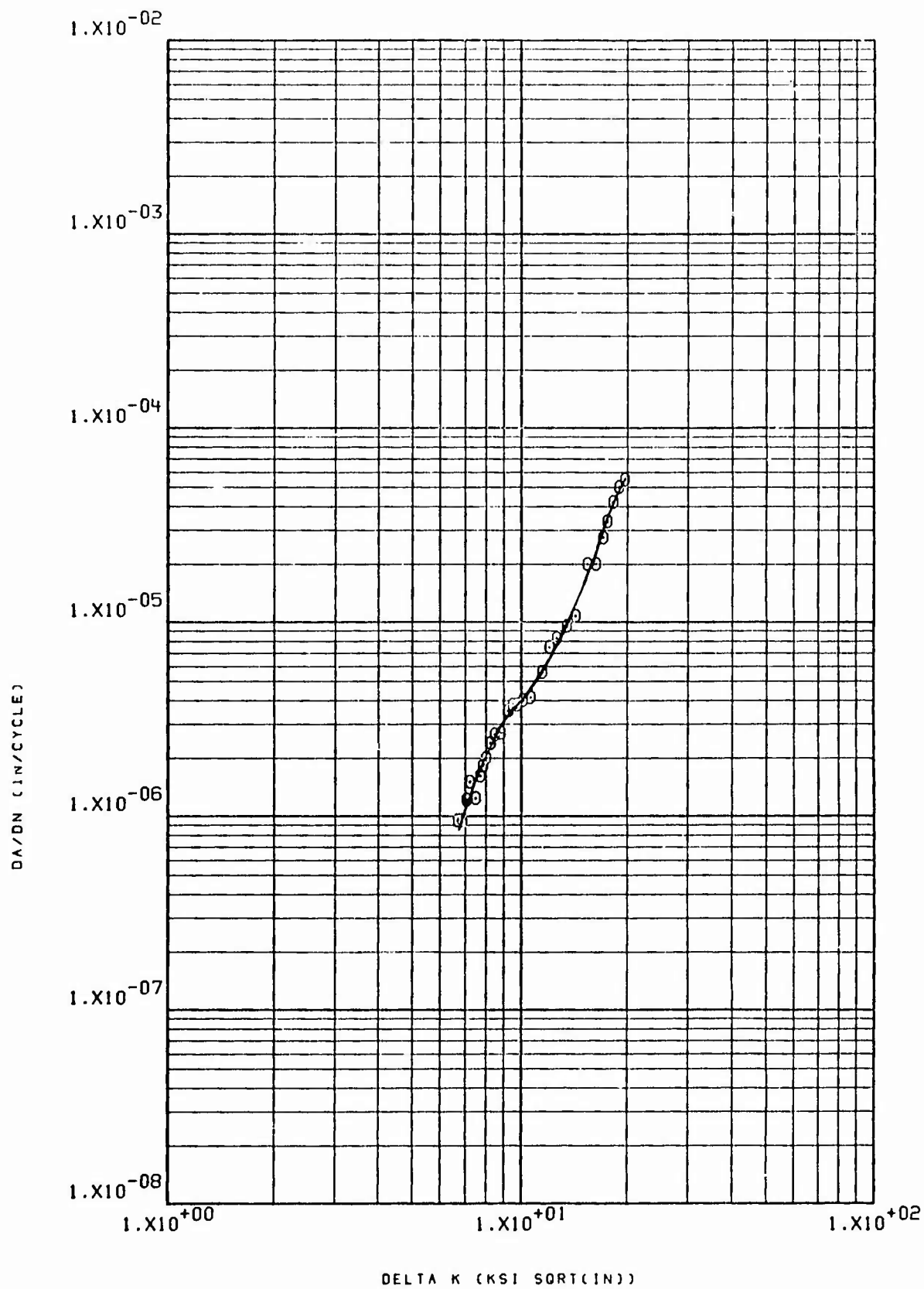


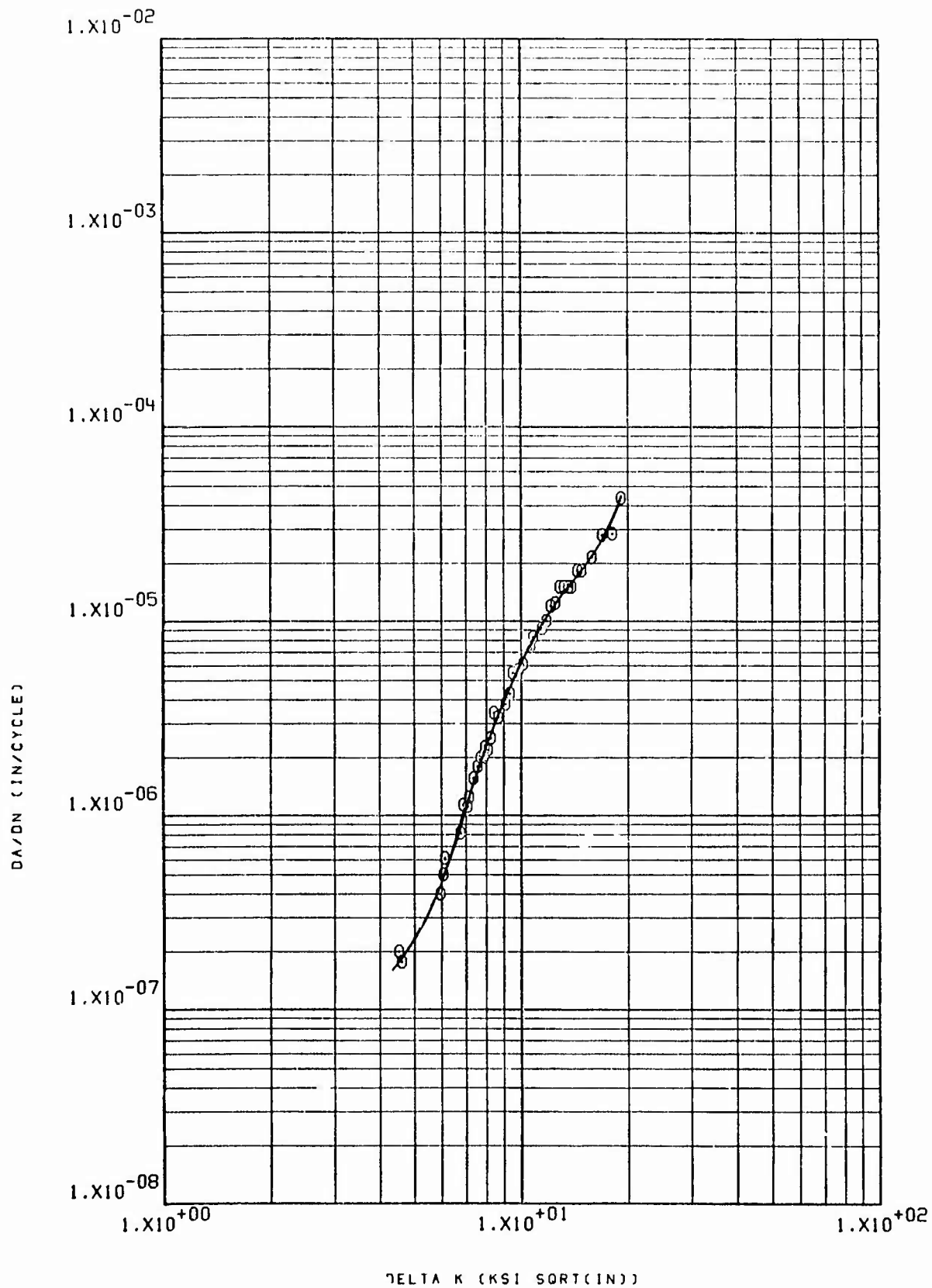


18NWR 51-15 7075-17651 SHOP CLN SOLV RT R=.08 60CPM



18 NVR 51-16 7075-T7651 LHA RT R=.08 360CPM

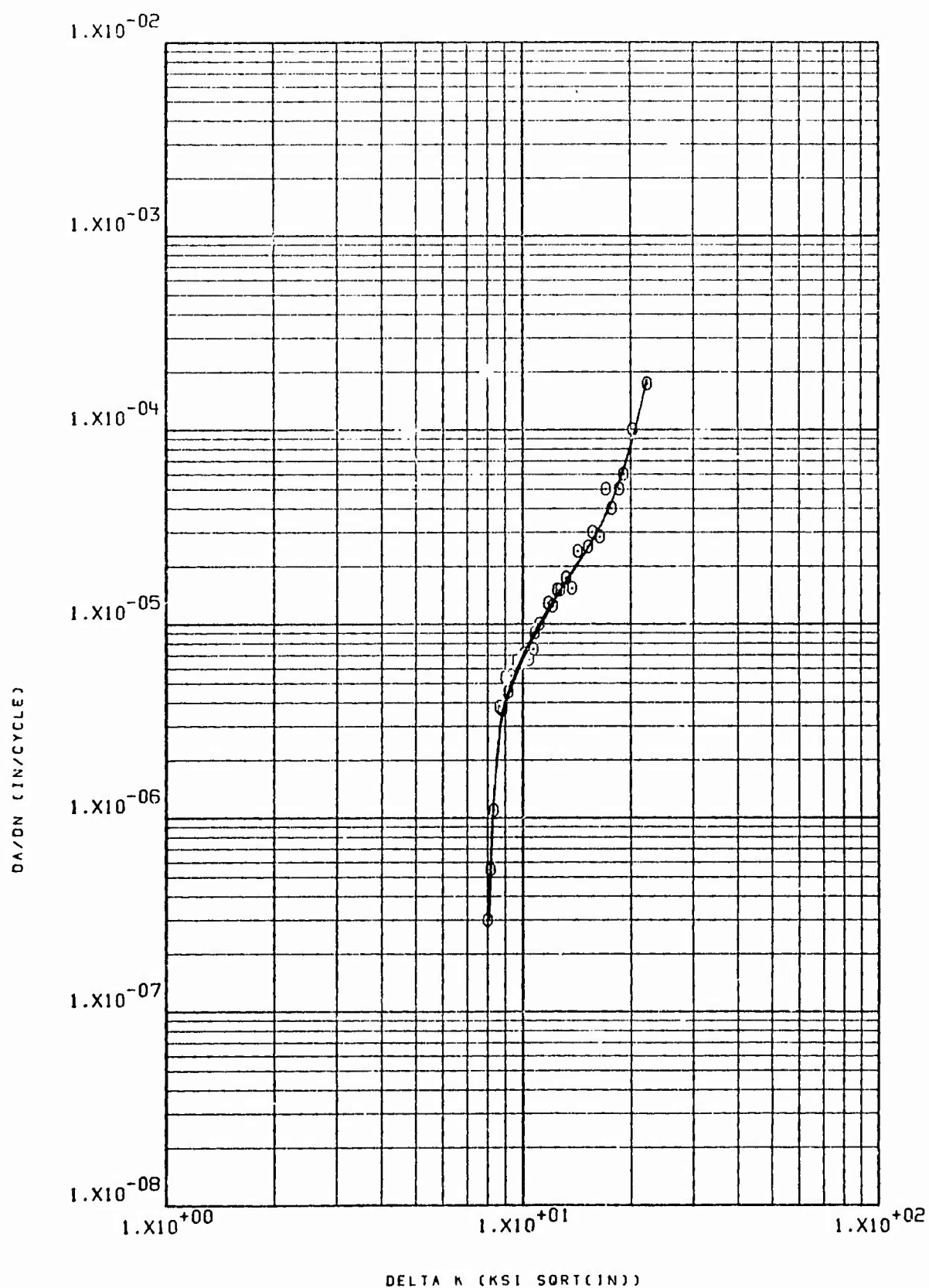


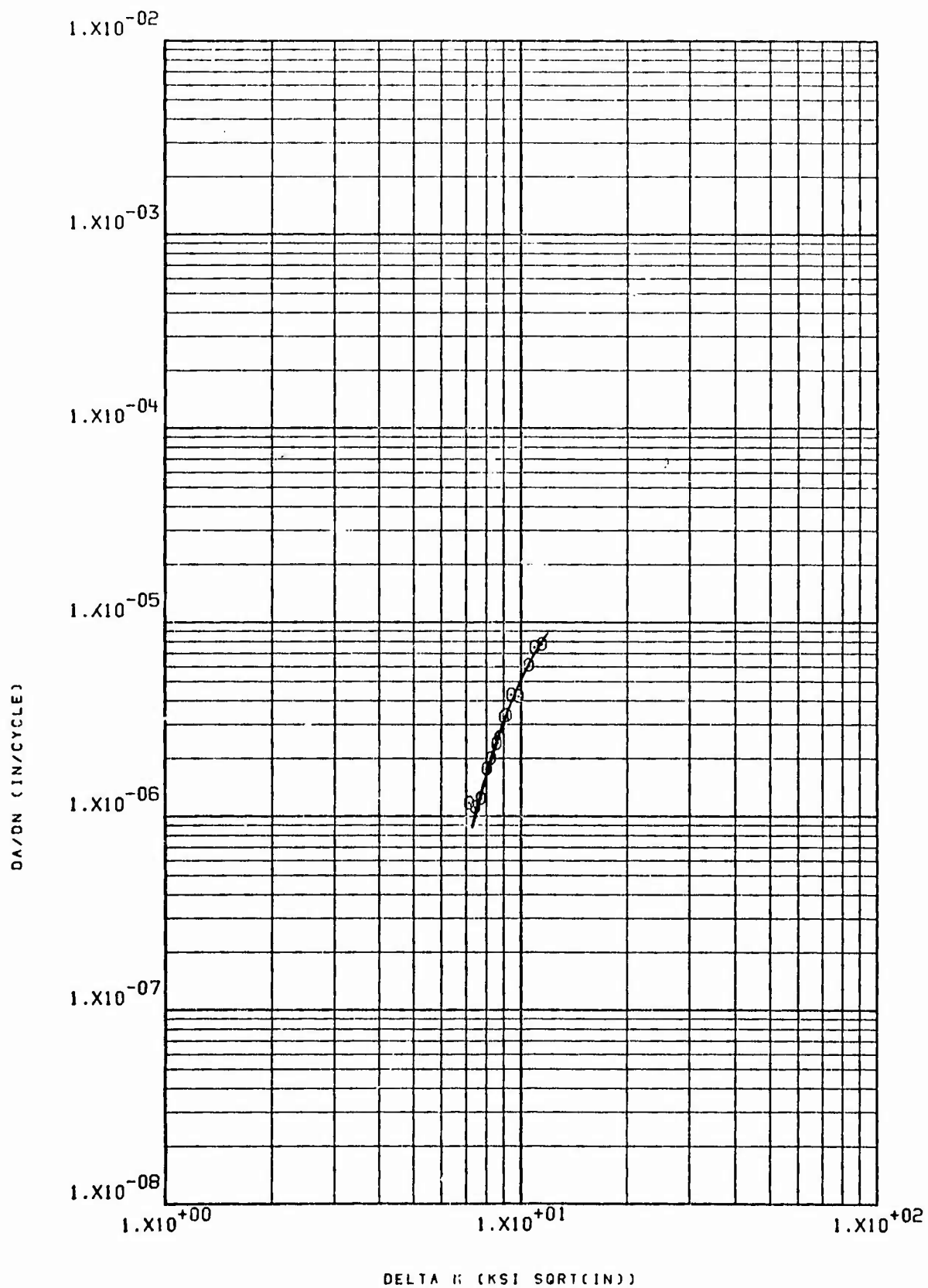


18 NRW 51-60 7075-17351

L.H.A.

R.T. 60CPM R=.08

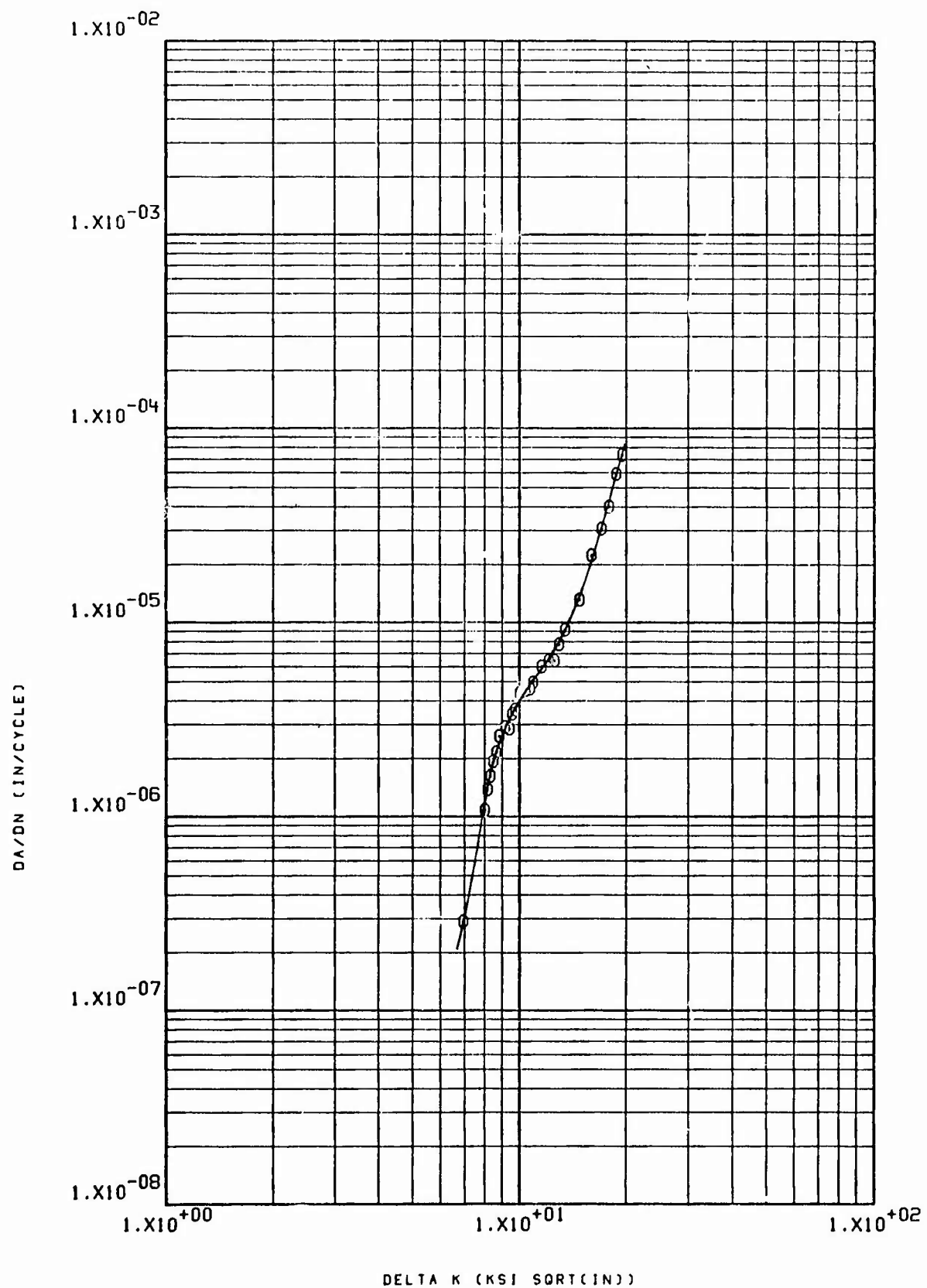




18 NRW 51-62 7075-T7351

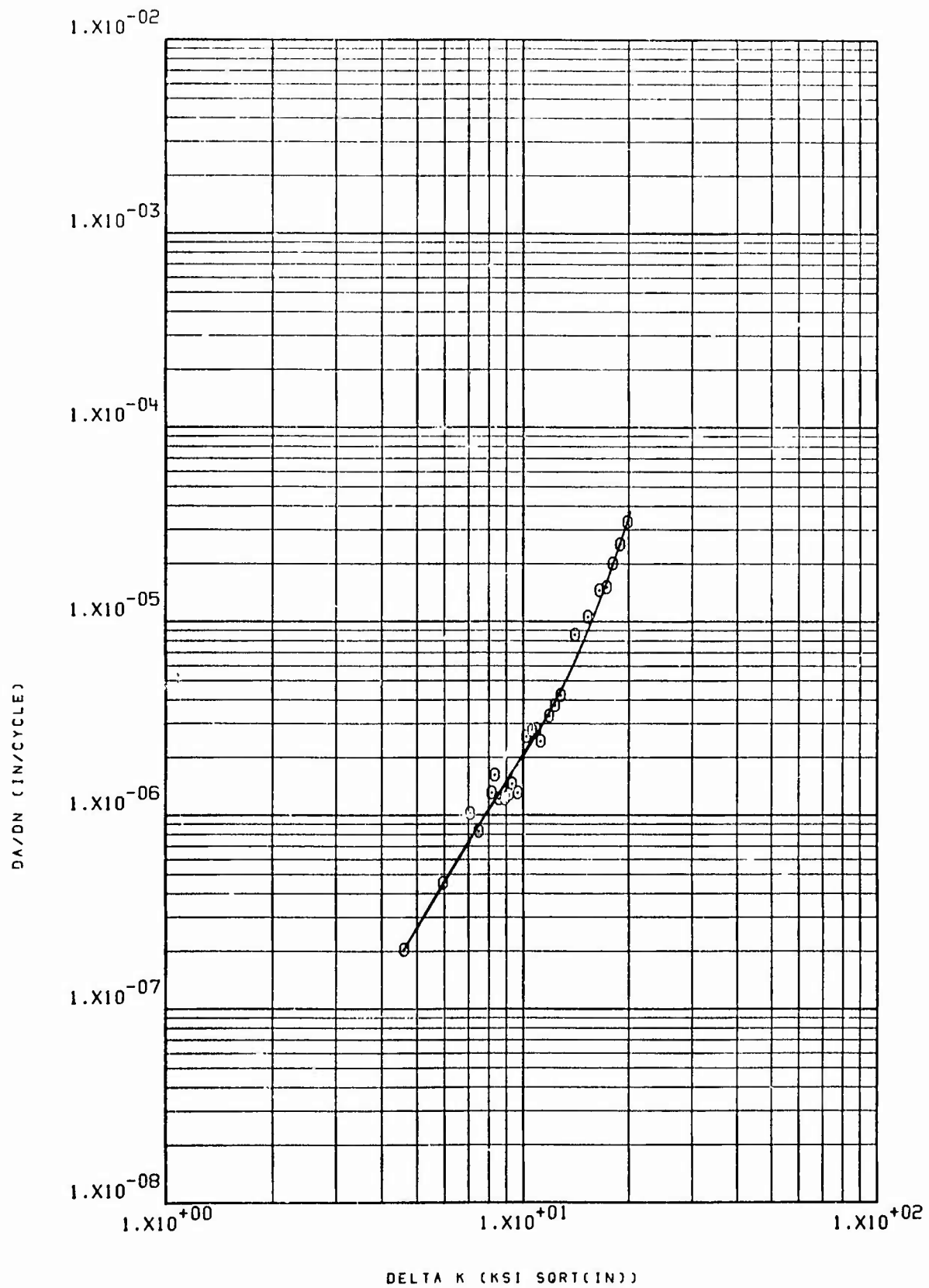
L.H.A.

R.T. 360CPM R=.08

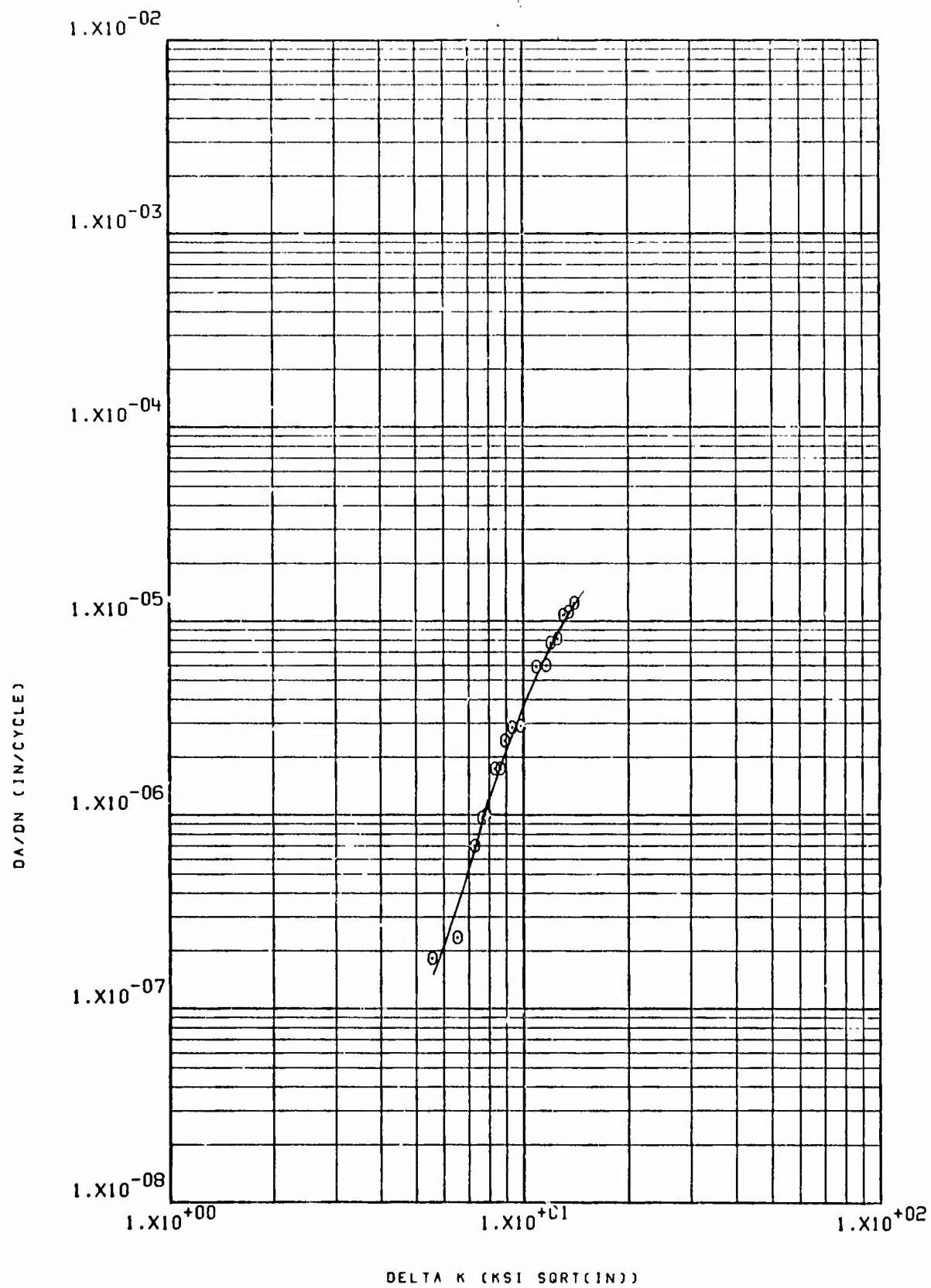


18NWR51-63 7075-T7351 LHA RT 360CPH R=.08

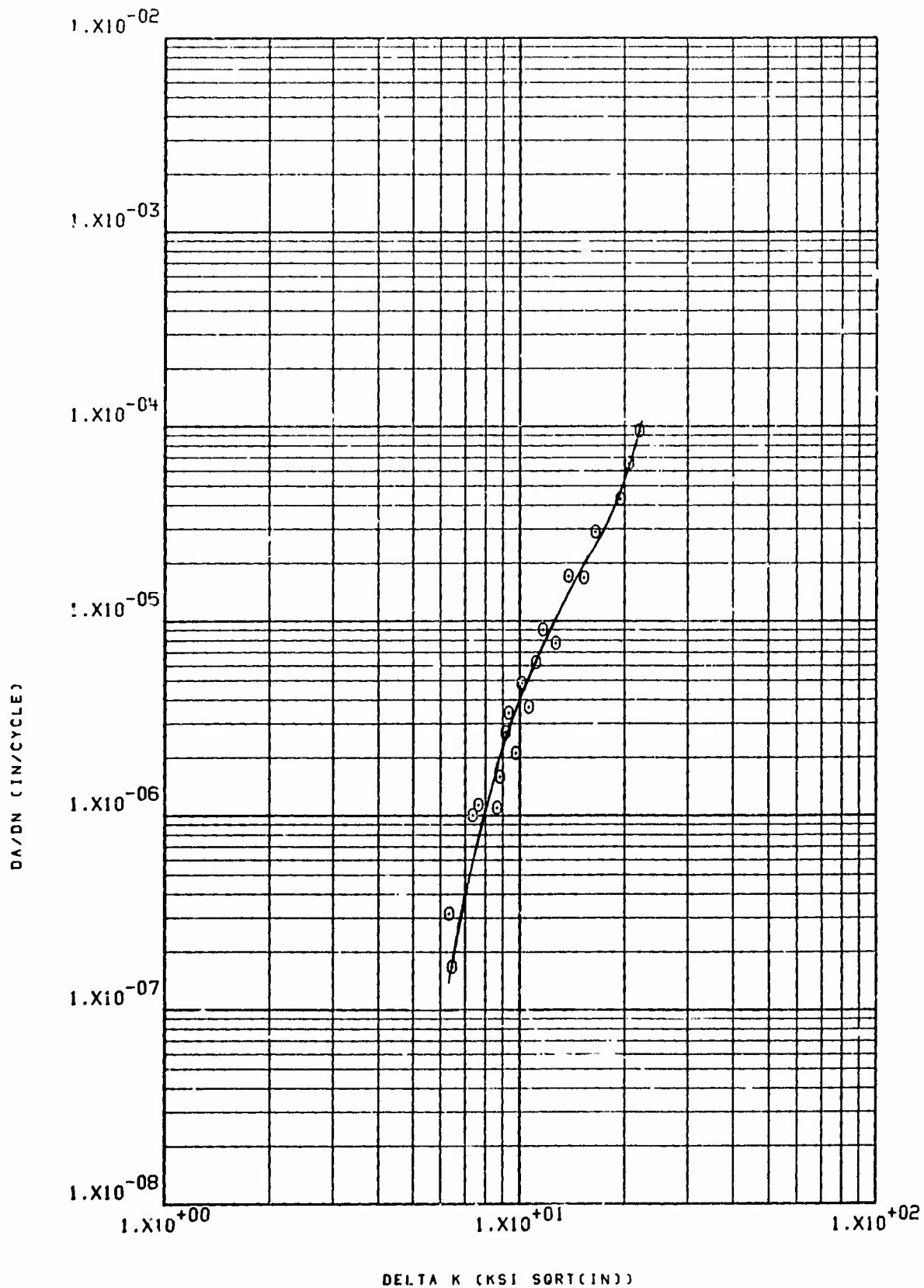




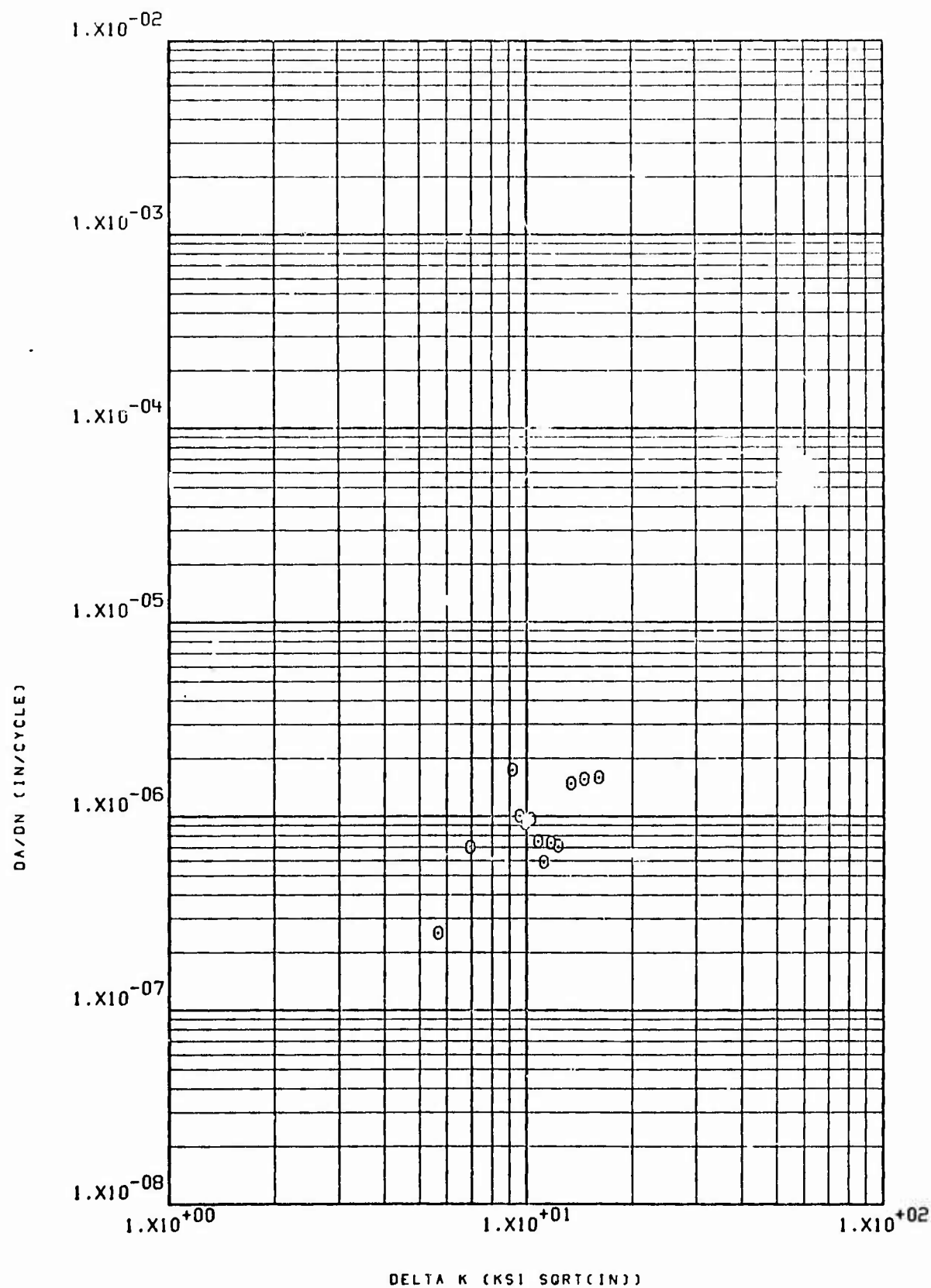
19 NRW 64-13 2024-T852 FORGING LHA RT R=.08 360CPM



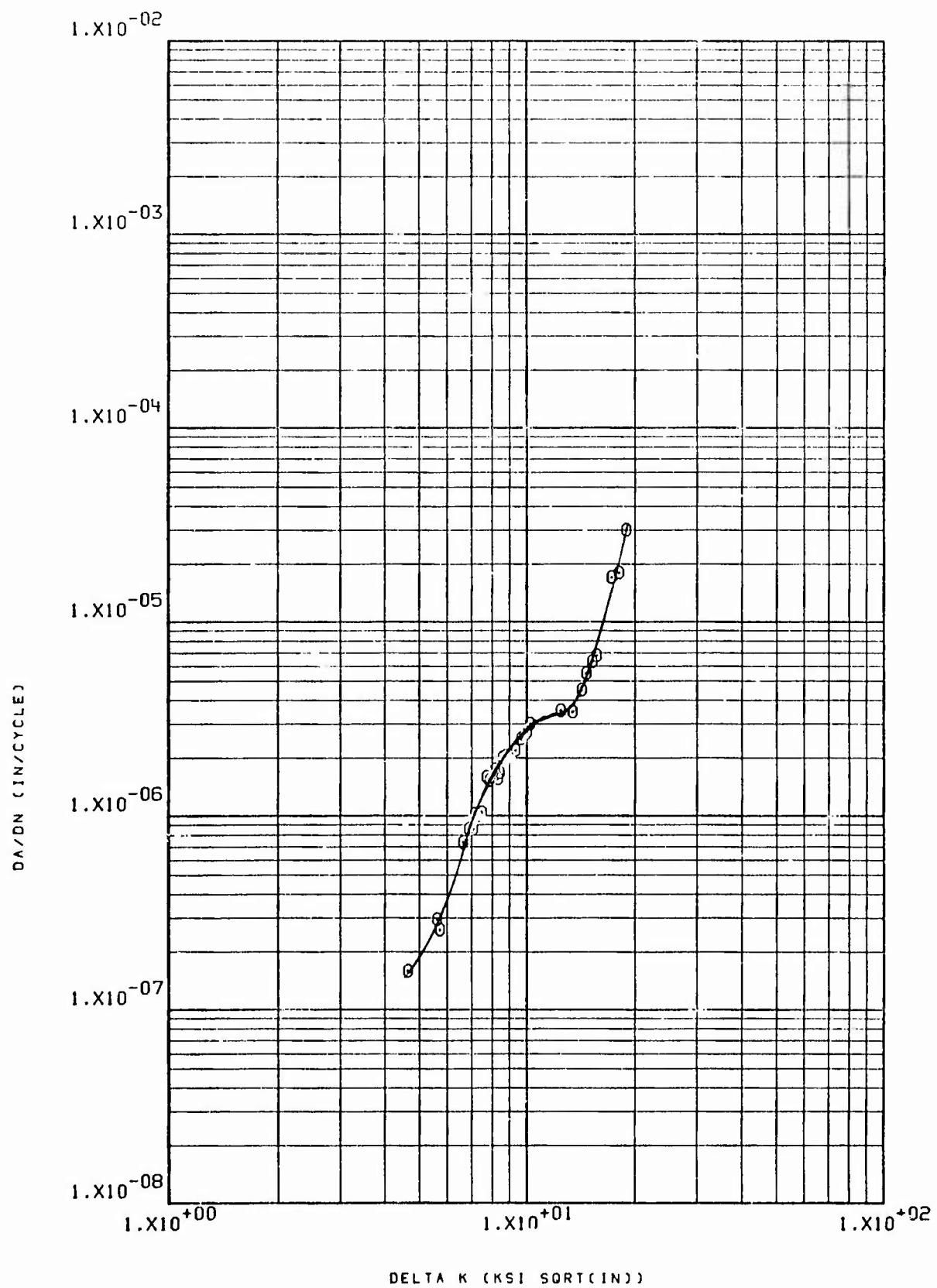
19 NRW 64-14 2024-1252 FORGING LLHA RT R=.08 60CPM



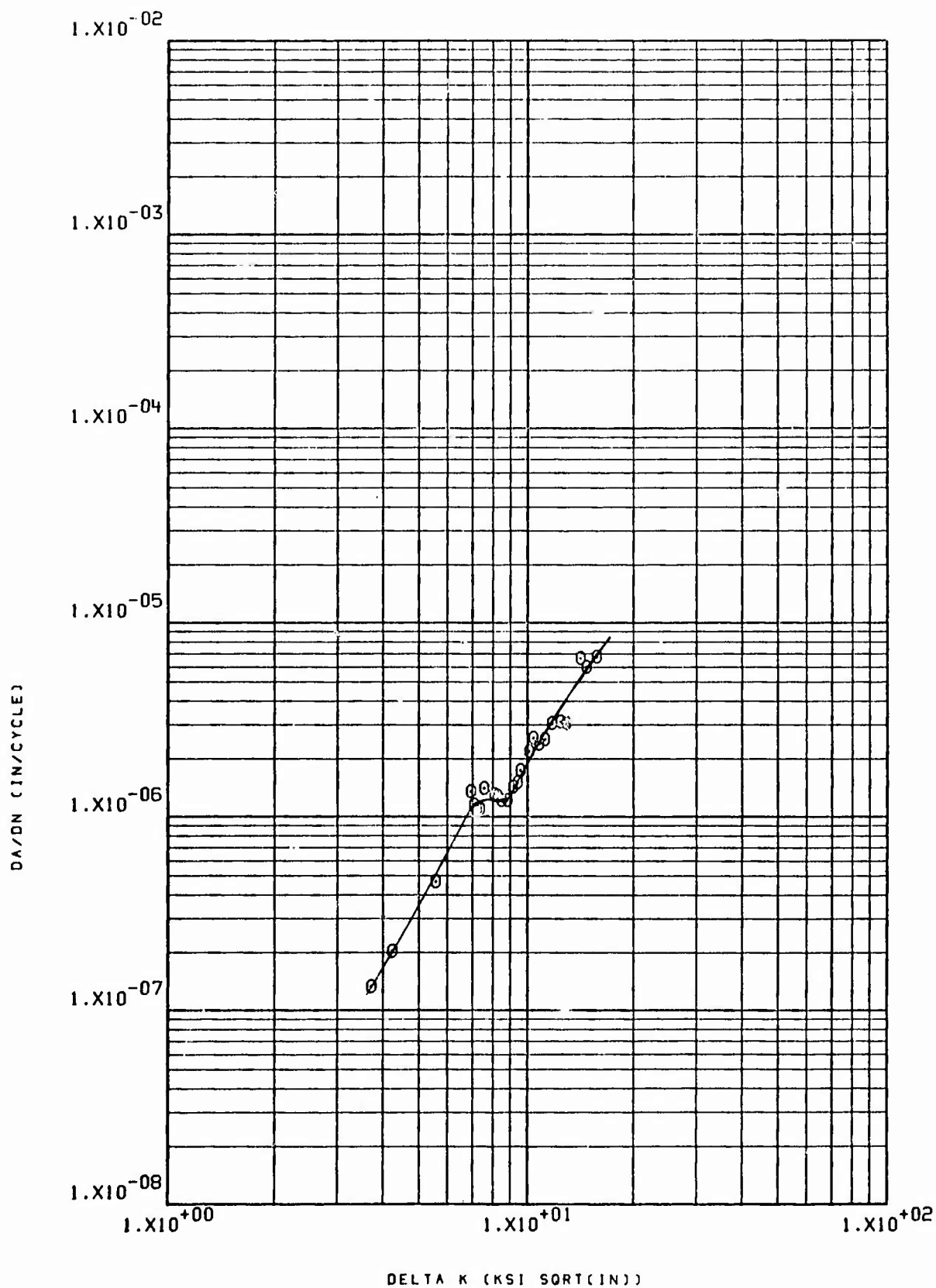
19 NRW 64-15 2024-T-852 HAND FORGING SUMP 60CPM R=.08 R.T.



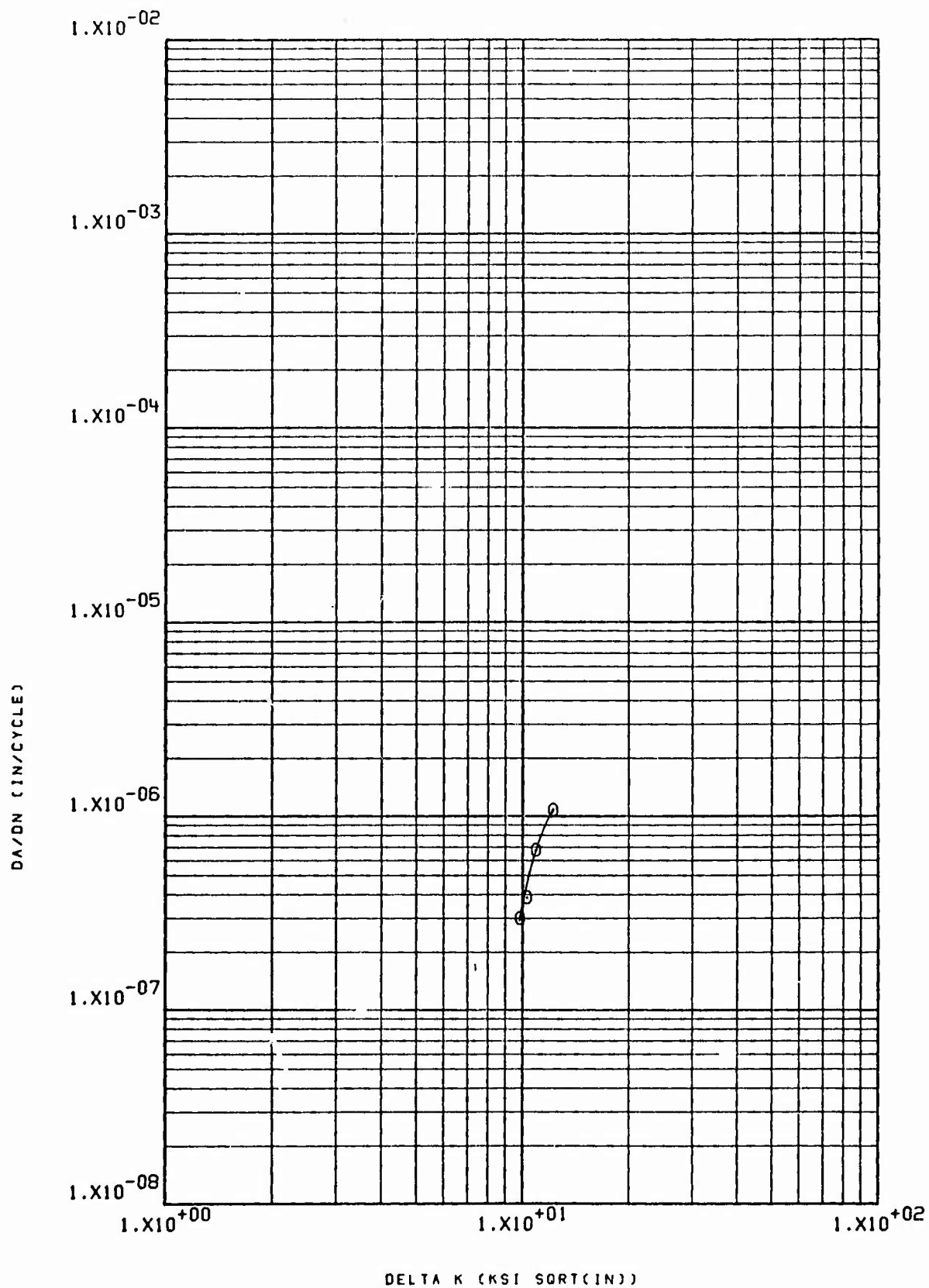
19 NRW 64-16 2024-1852 FORGING LHA RT R=.08 360CPH

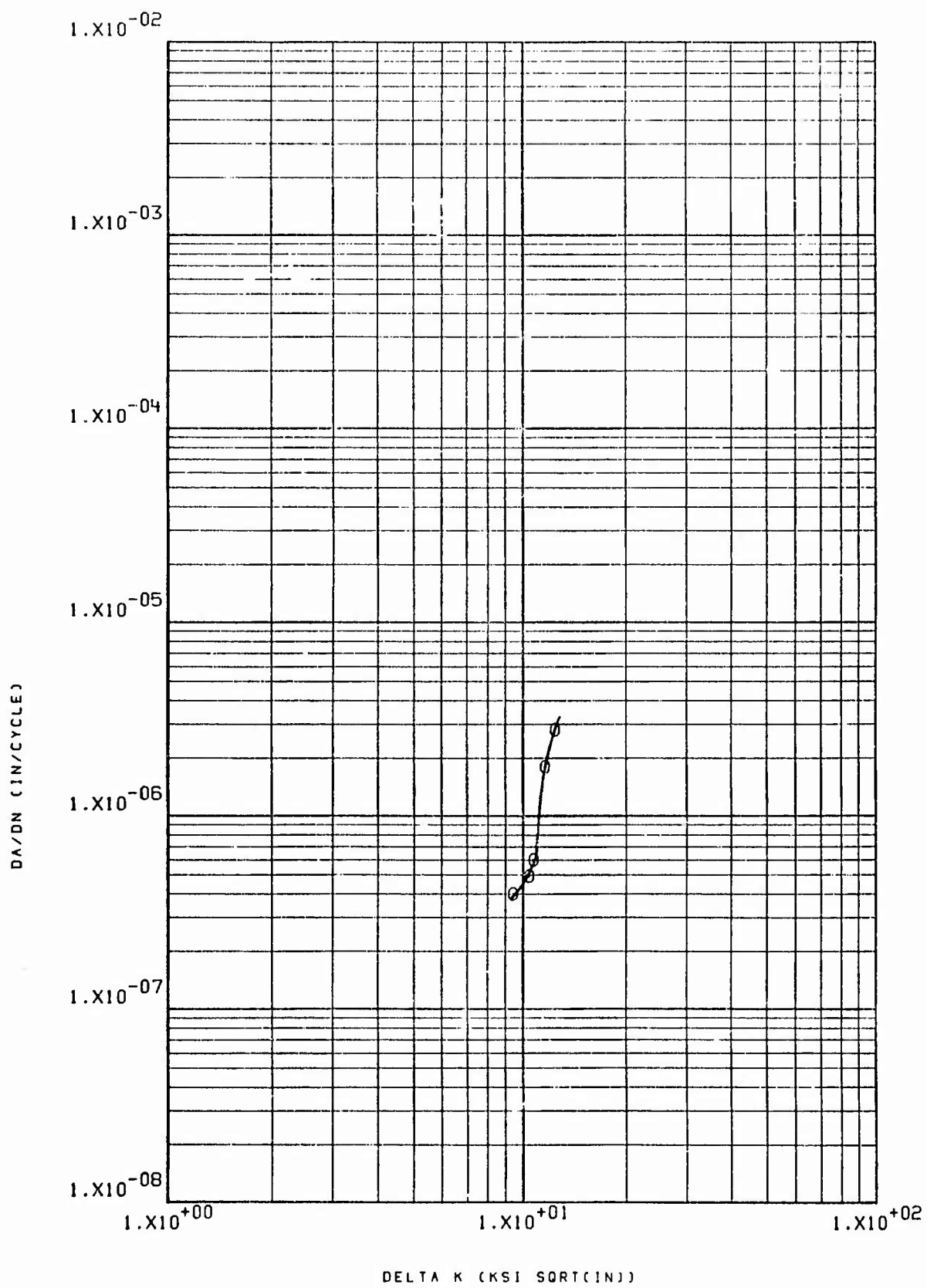


19NWR64-17 2024-T852 HAND FORG LHA RT 360CPM R=.08



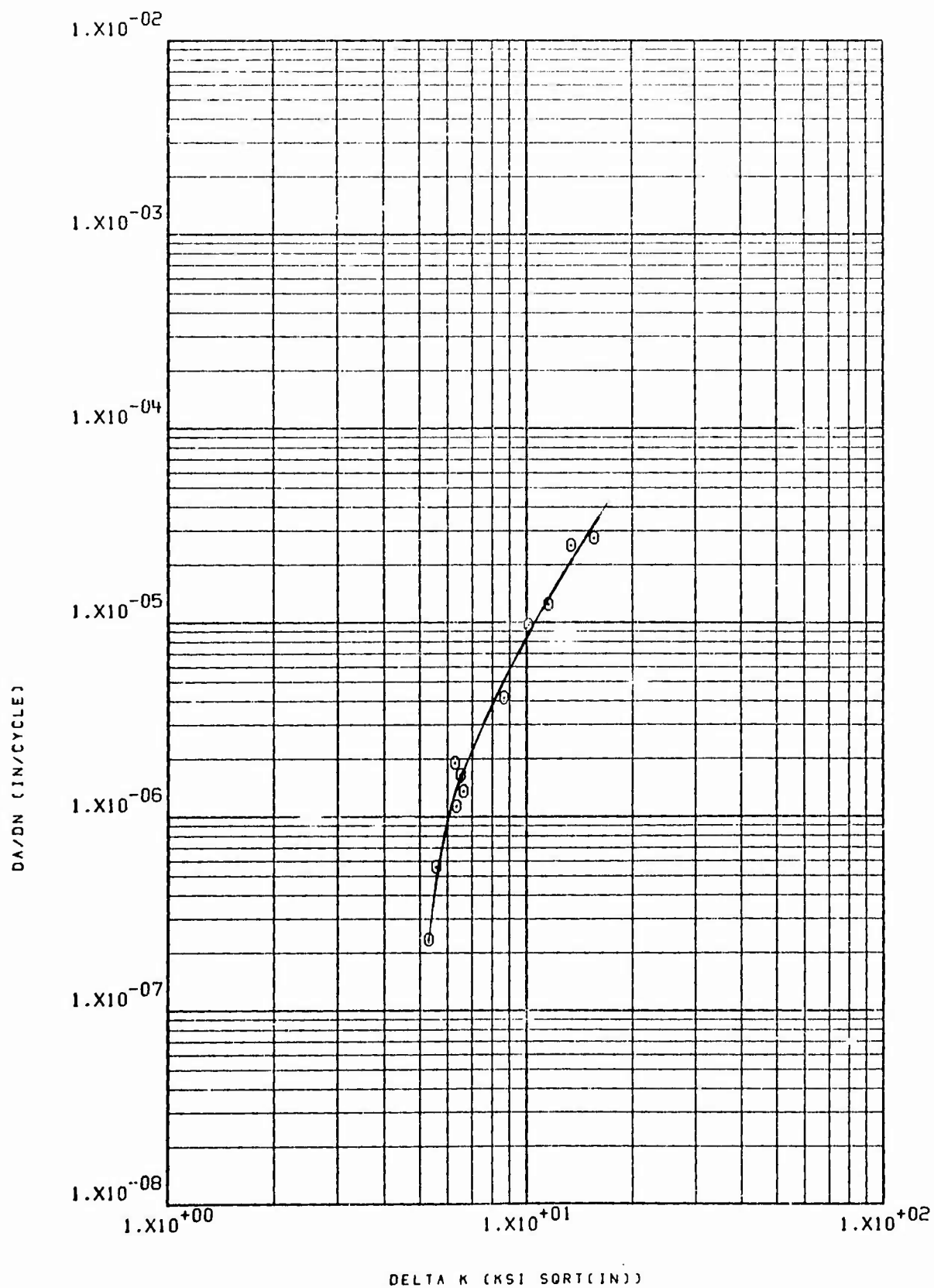
20 NRW 65-1 2219-T852 FORGED BILLET LHA RT 360CPM R=.08

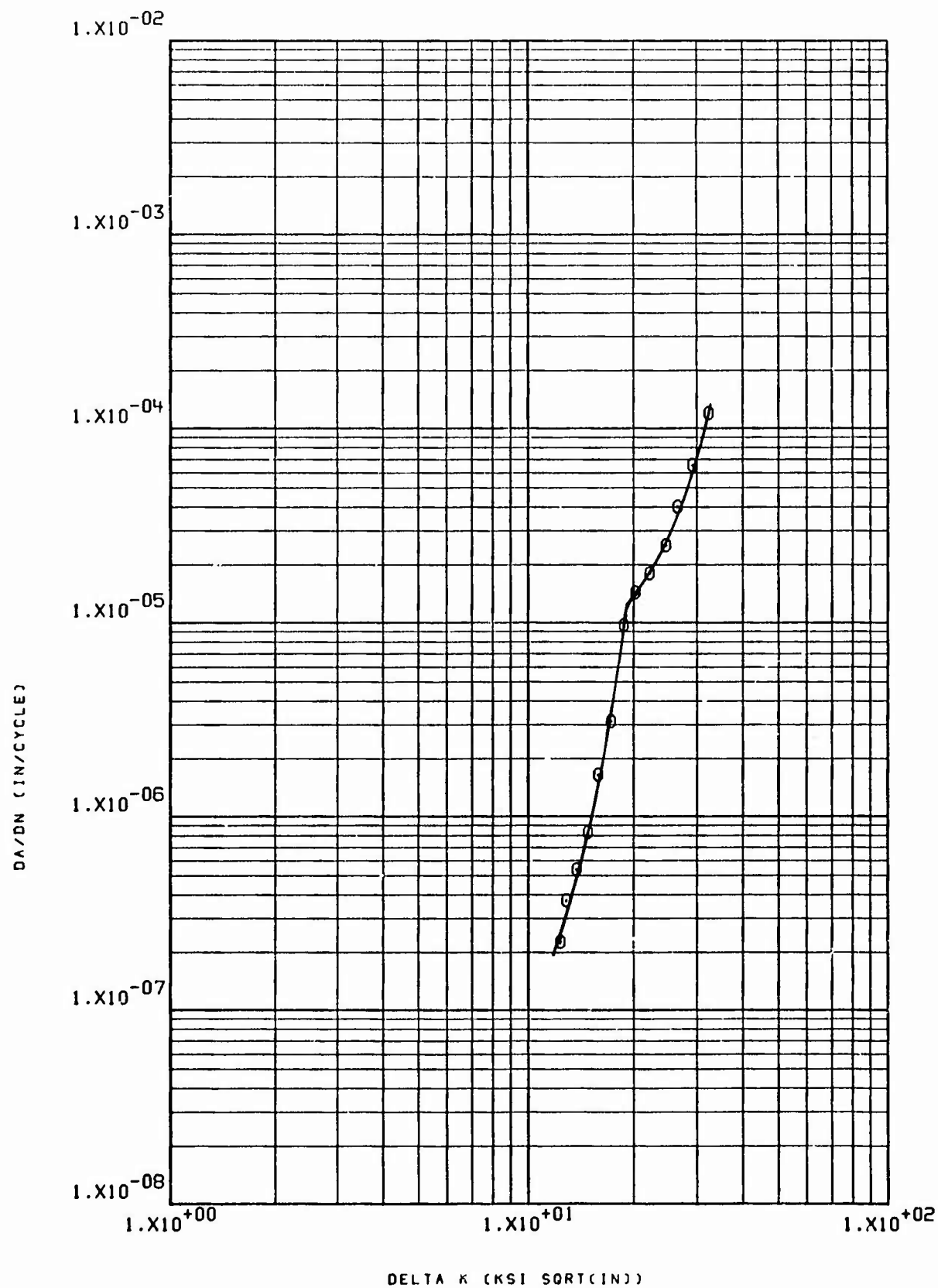




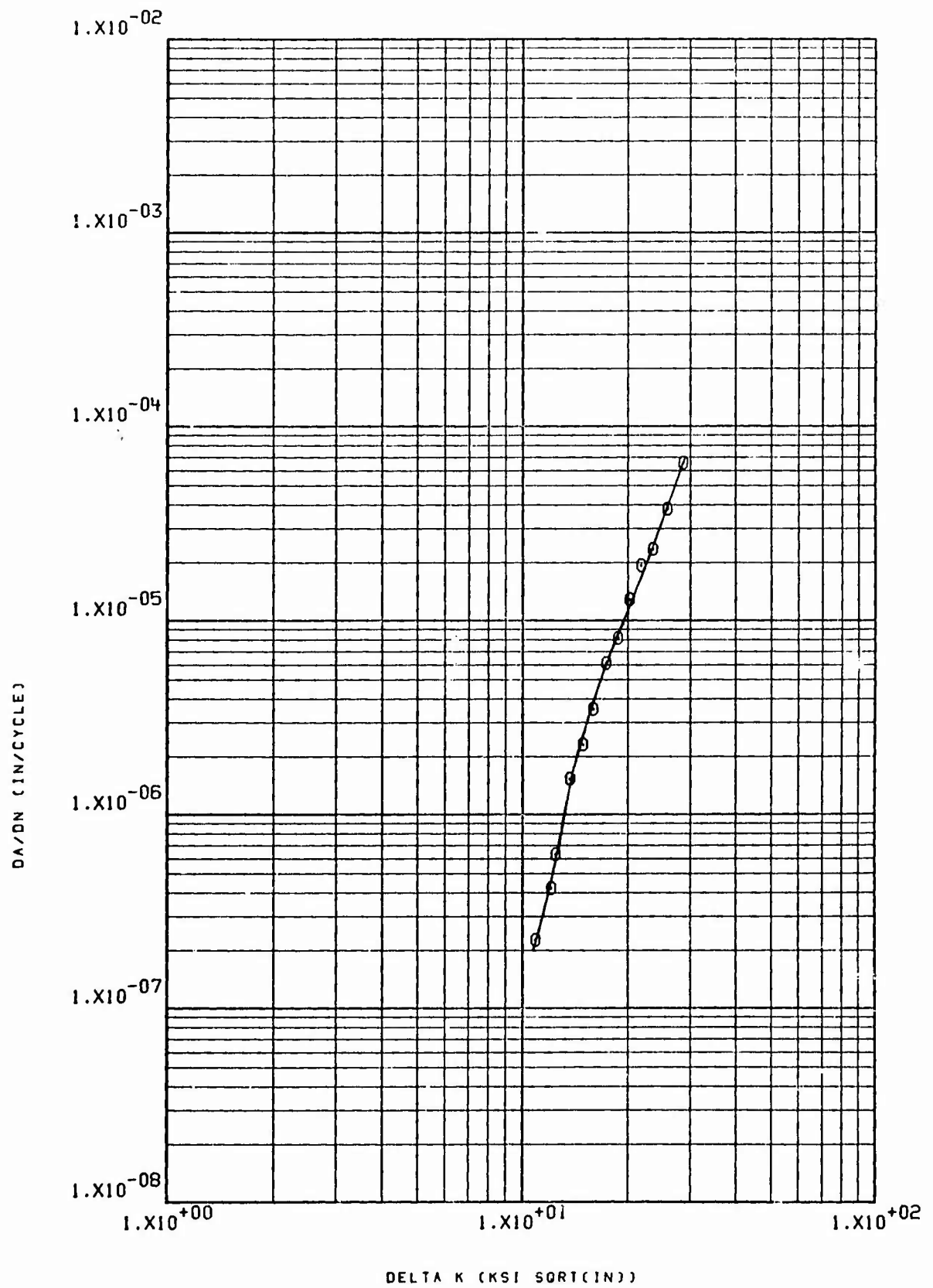
-T 7352
22 NRW 68-1 7075- LHA R.T. 360CPH R=.08

B-100



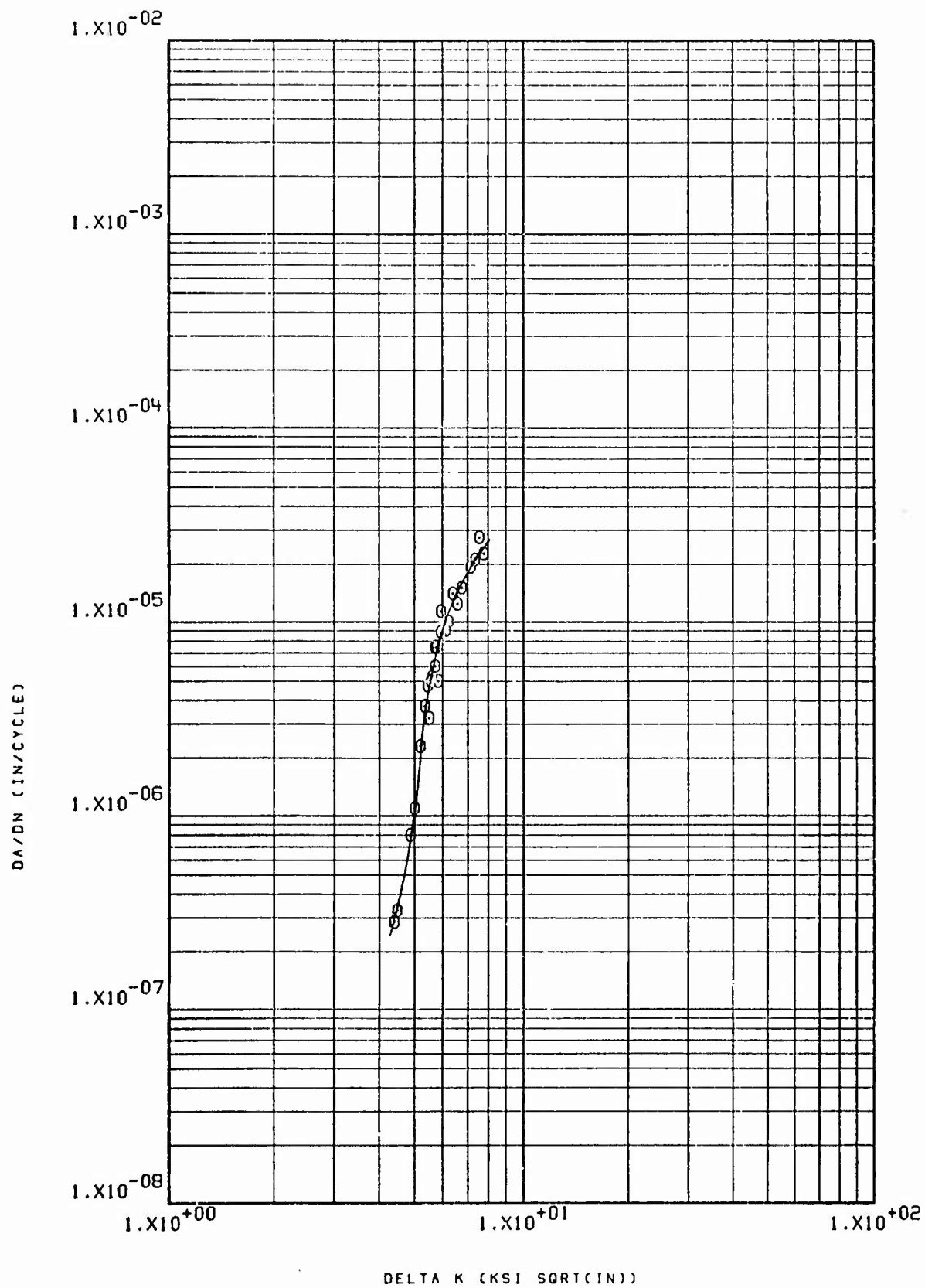


23 NRW 69-1 7050-T-73 FORGING LHA R.T. 360CPM R=.03

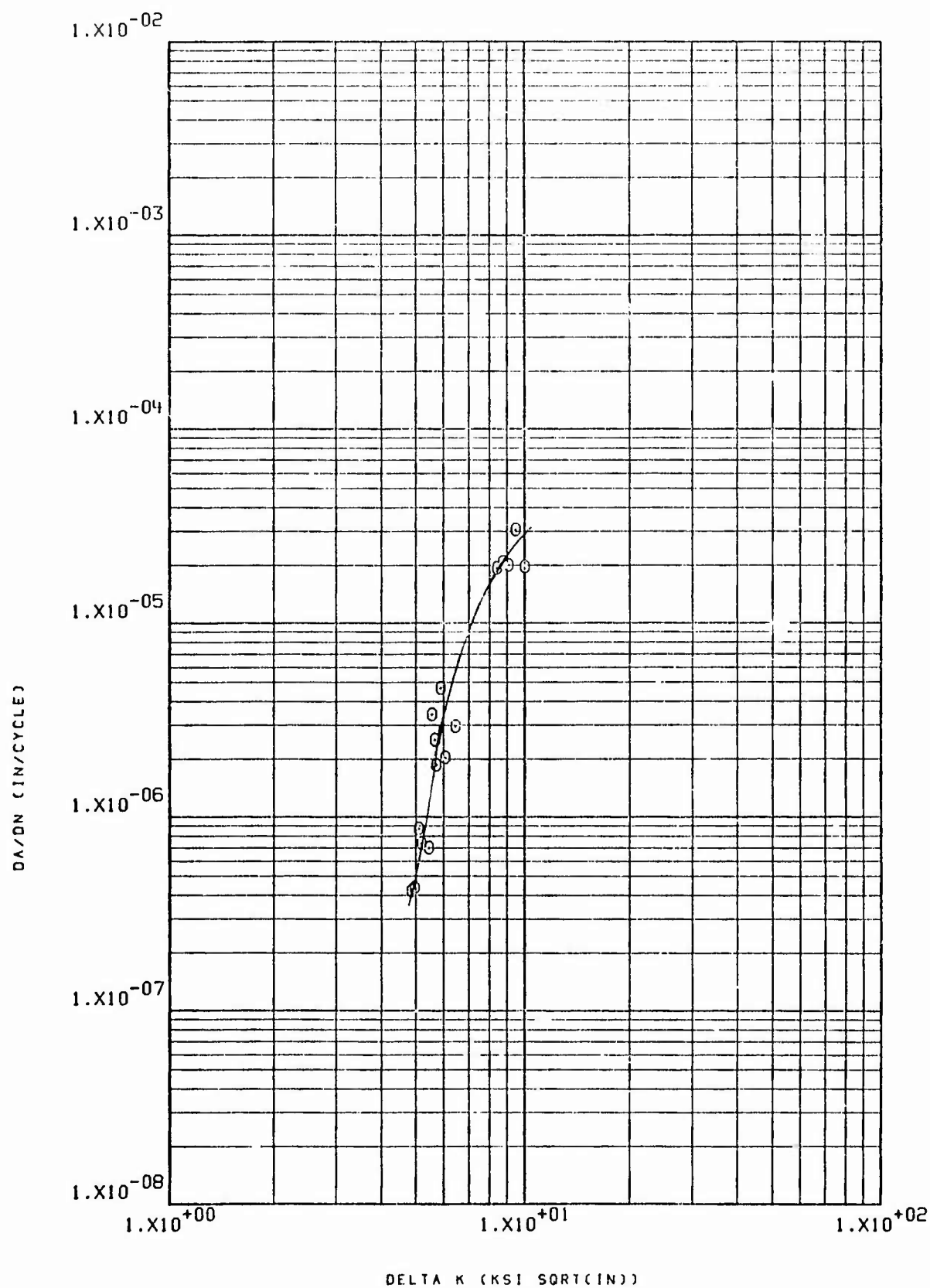


24 NRW 70-1 7049-T73 ALUM LHA RT R=.08 360CPH
(3r Mo.)

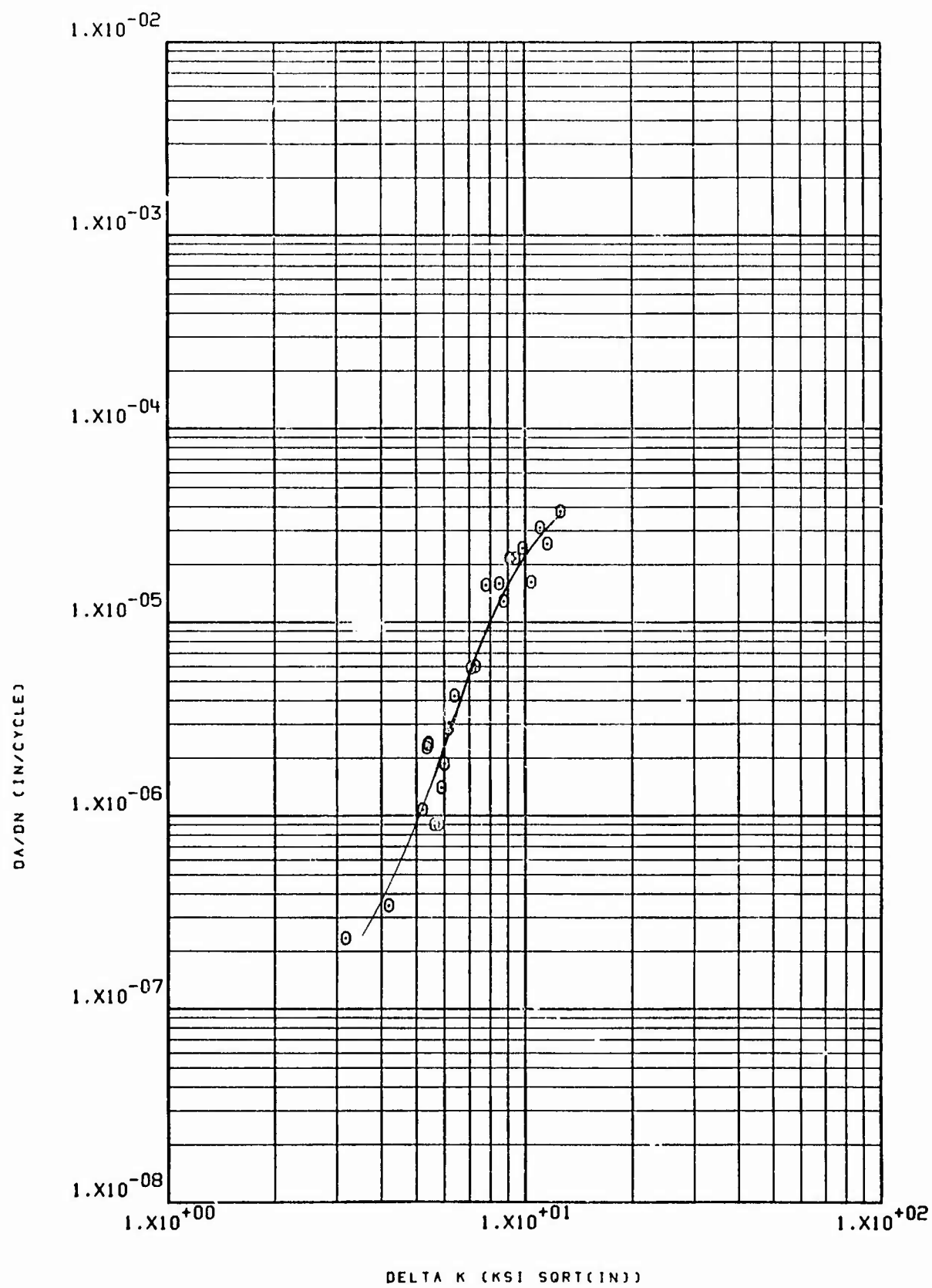
B-103



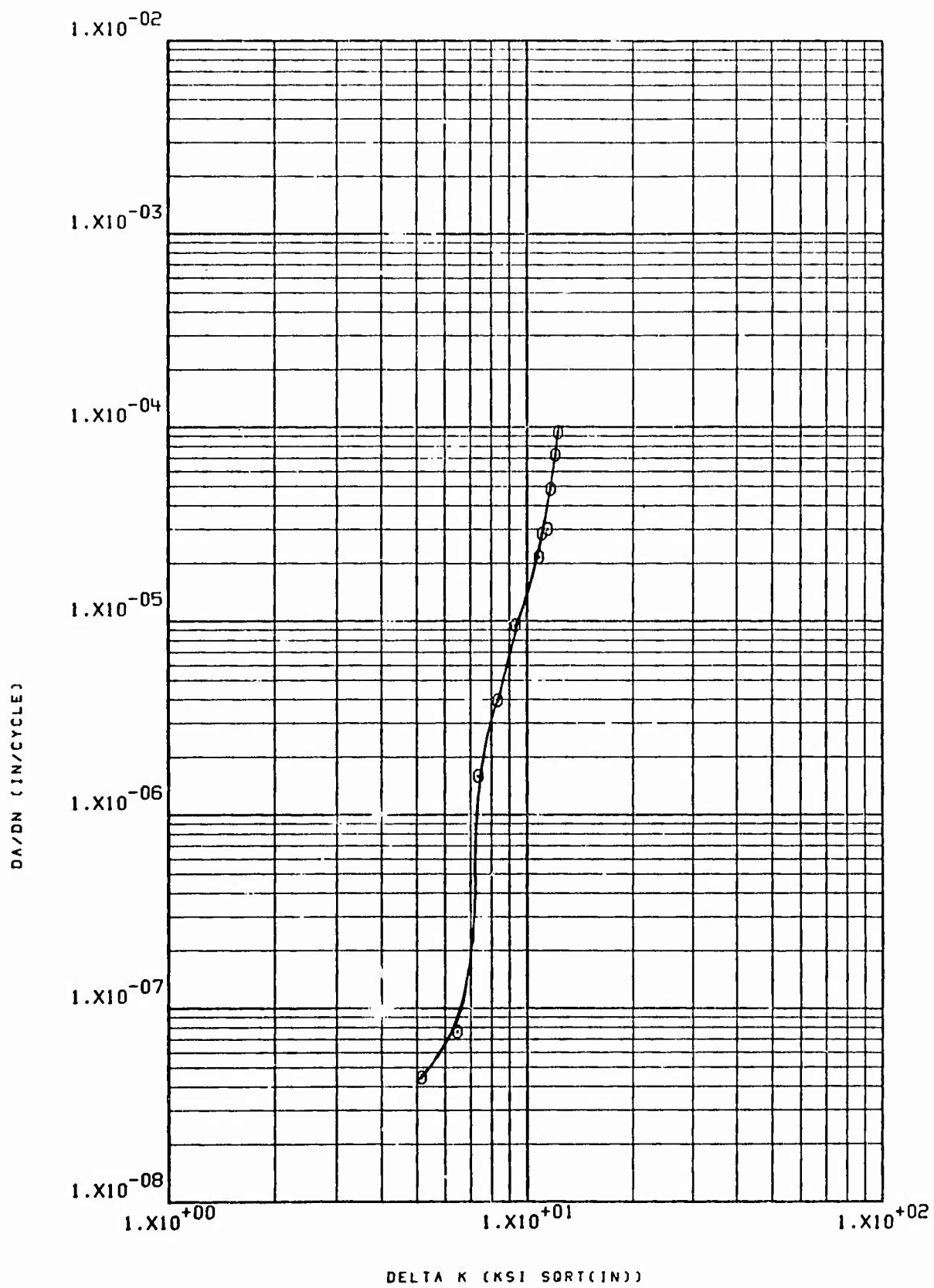
25 NRW 71-1 7049-T-7352 HAND FORGING SUMP R.T. 60CPM R=.5



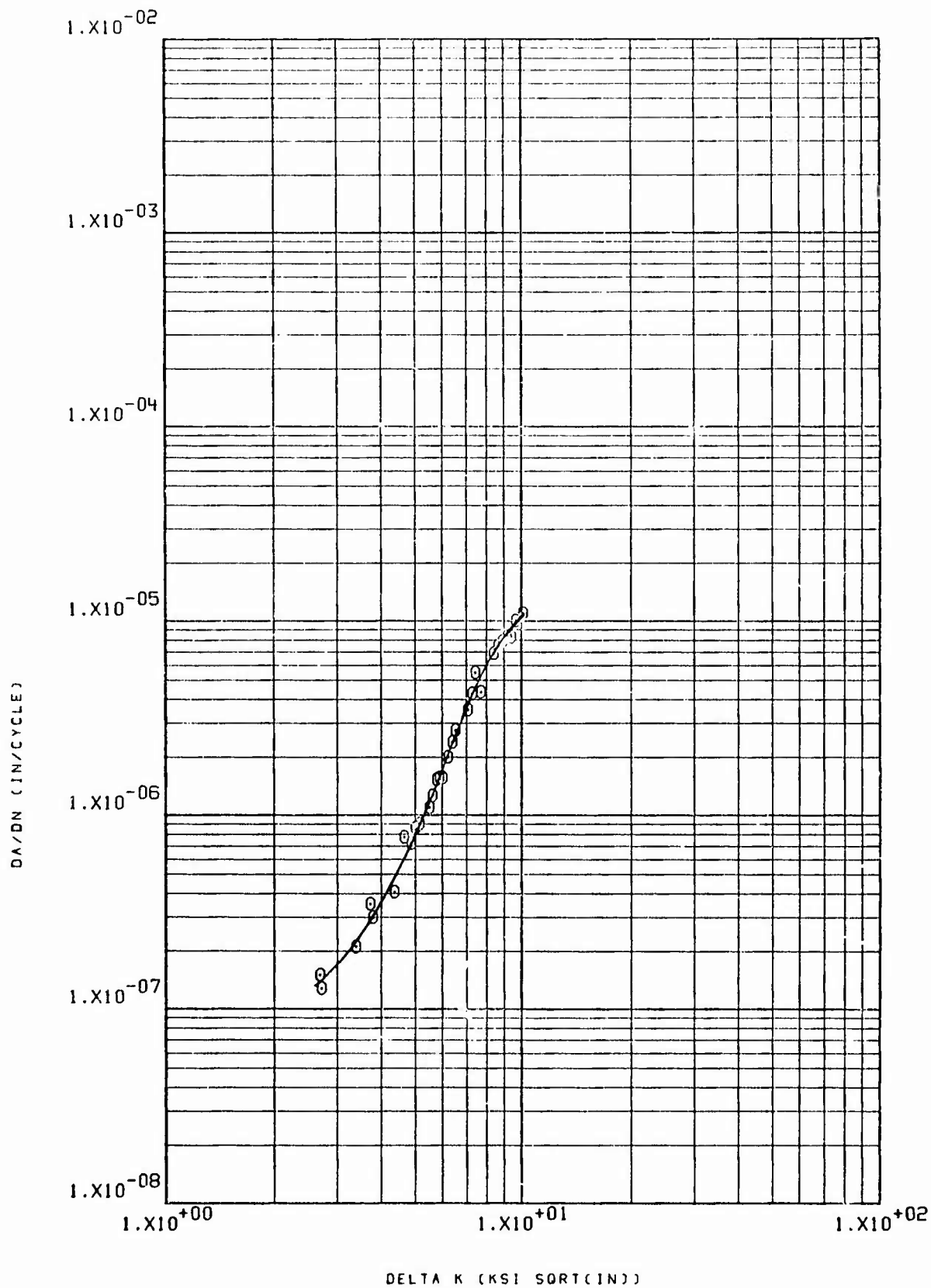
25 NRW 71-2 7049-T-7352 HAND FORGING SUMP R.1. 60CPM R=.3



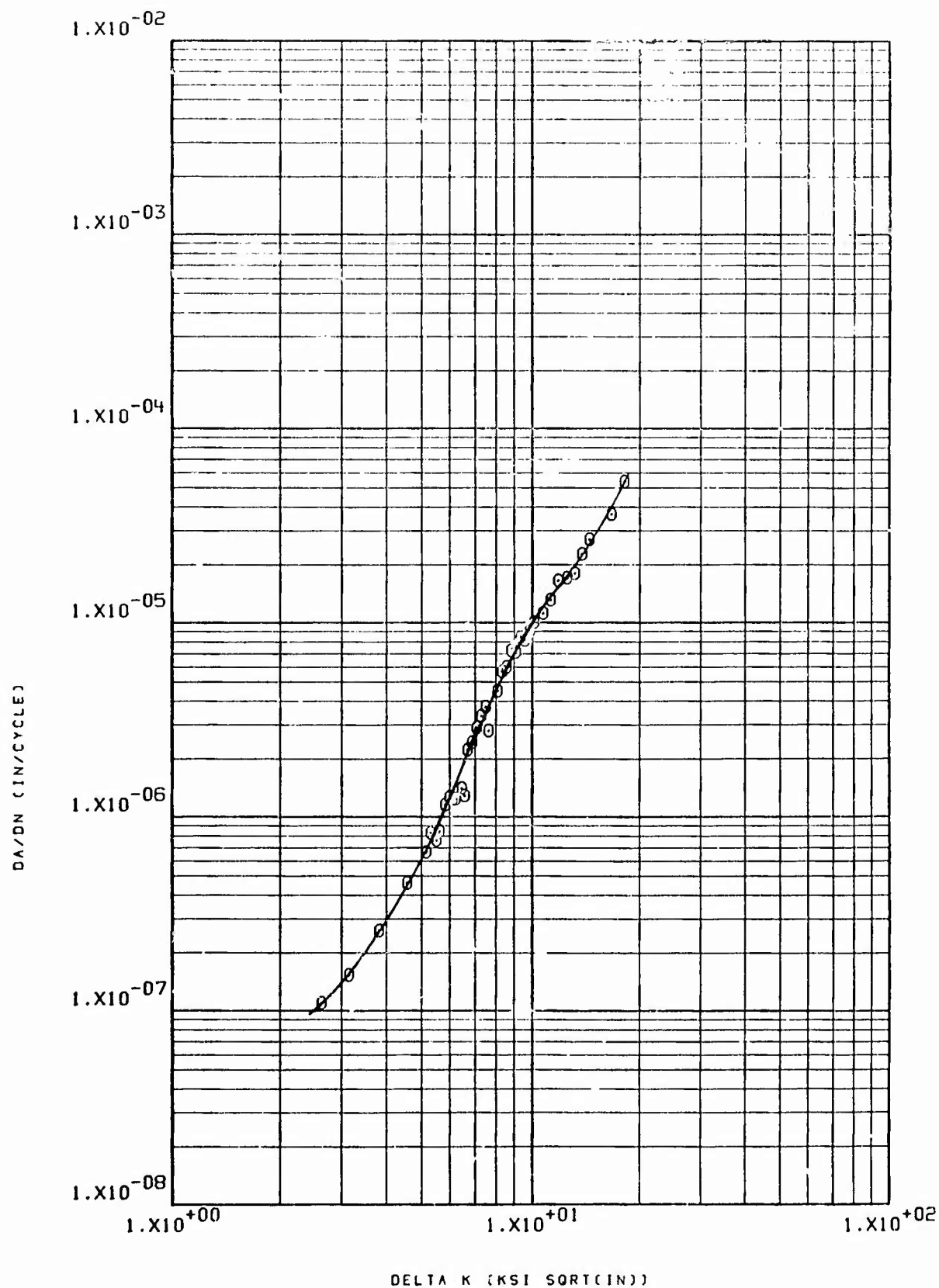
25 NRW 71-3 7049-17352 STW RT R=.08 60 CPM



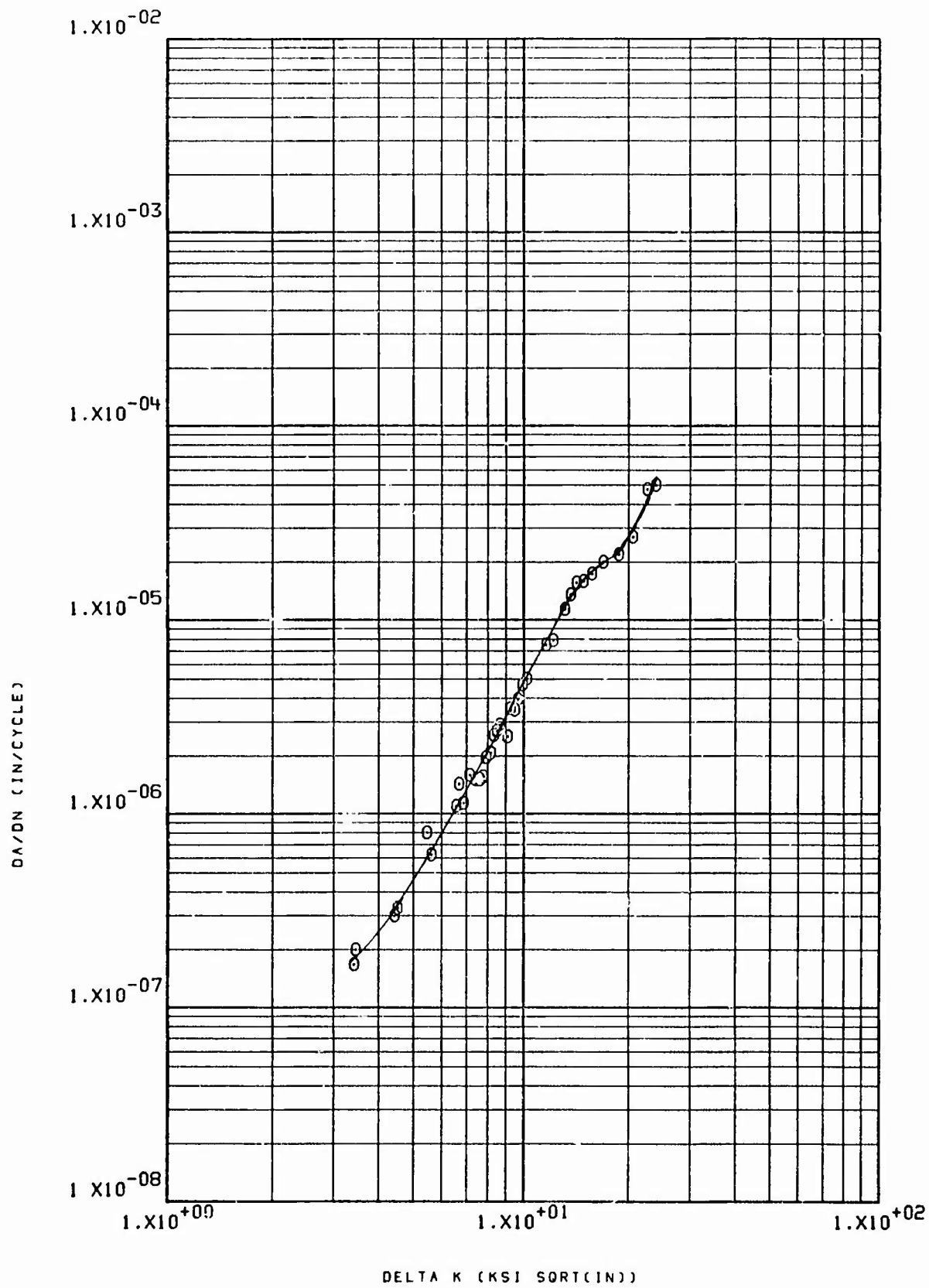
25 NRW 71-4 7049-T7352 FORG SUMP RT R=.08 6CPM



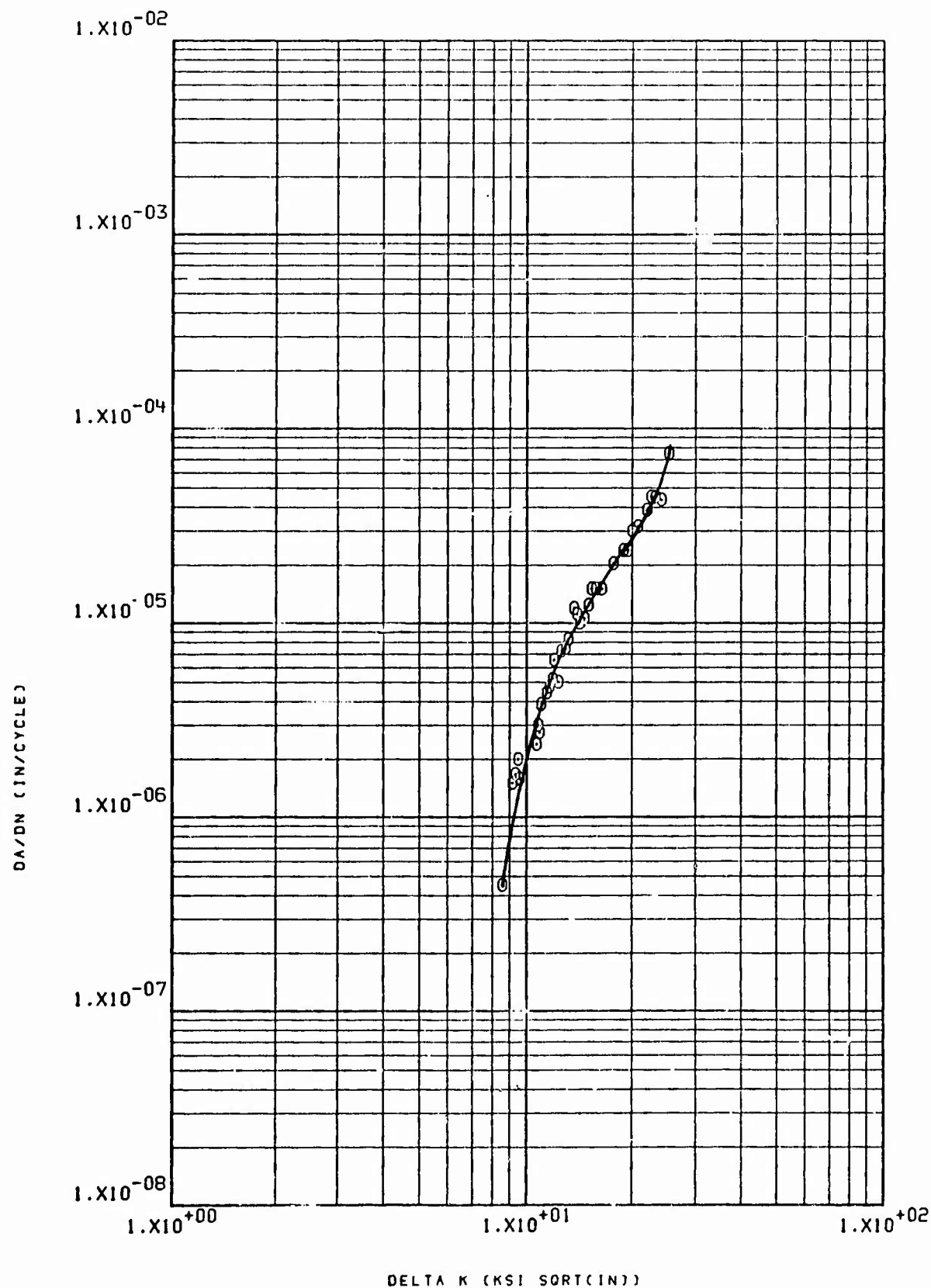
25 NRW 71-5 7049 17352 HAND FORGING RT LHA 360CPM R=.5



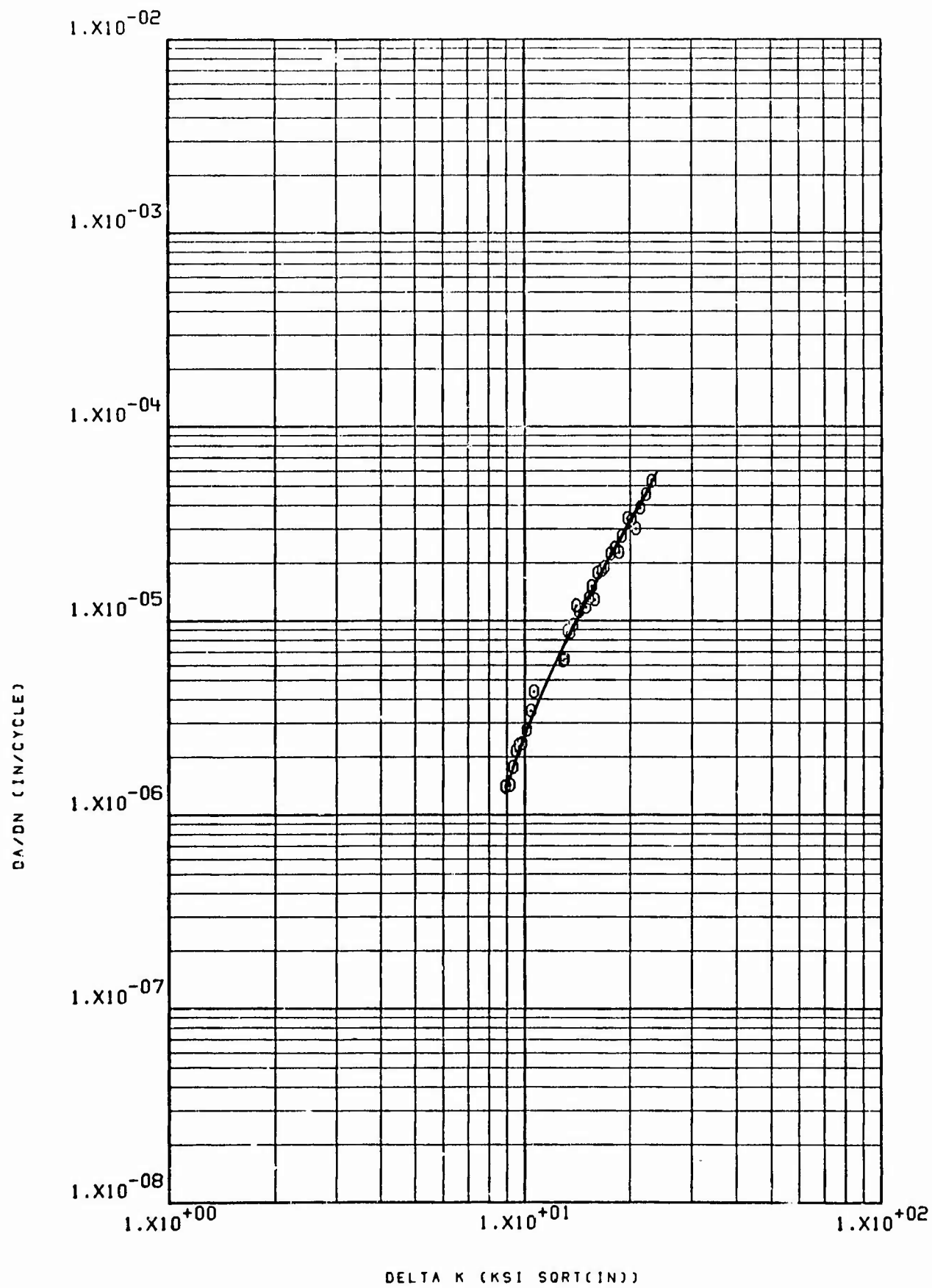
25 NRW 71-6 7049-17352 HAND FORGING RT LHA 360CPM R=.3



25 NRW 71-7 7049-T-7352 HAND FORGING LHA 360CPM RT R=.08

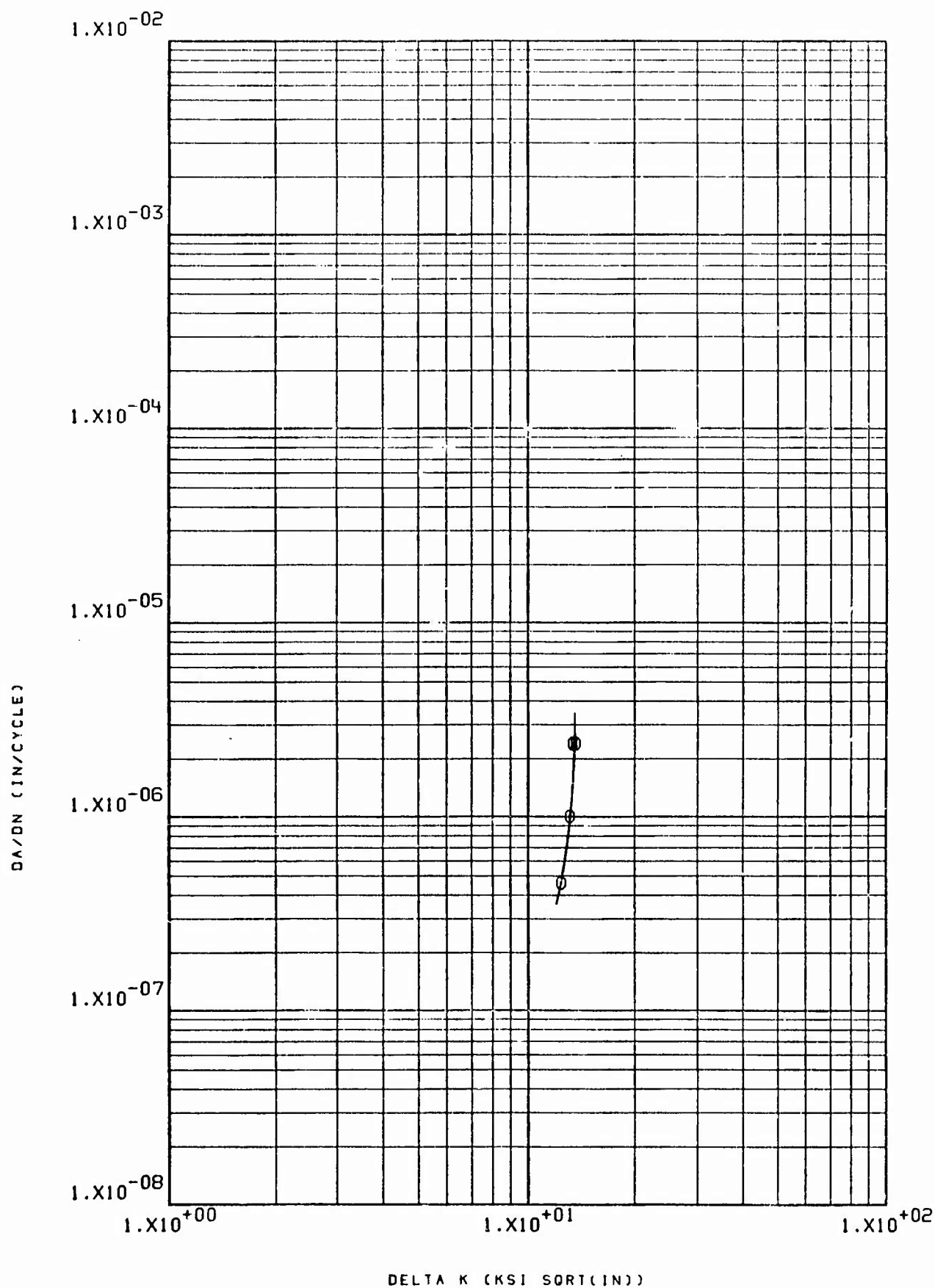


25 NRW 71-9 7049-17352 FORG LHA RT R=.08 360CPM

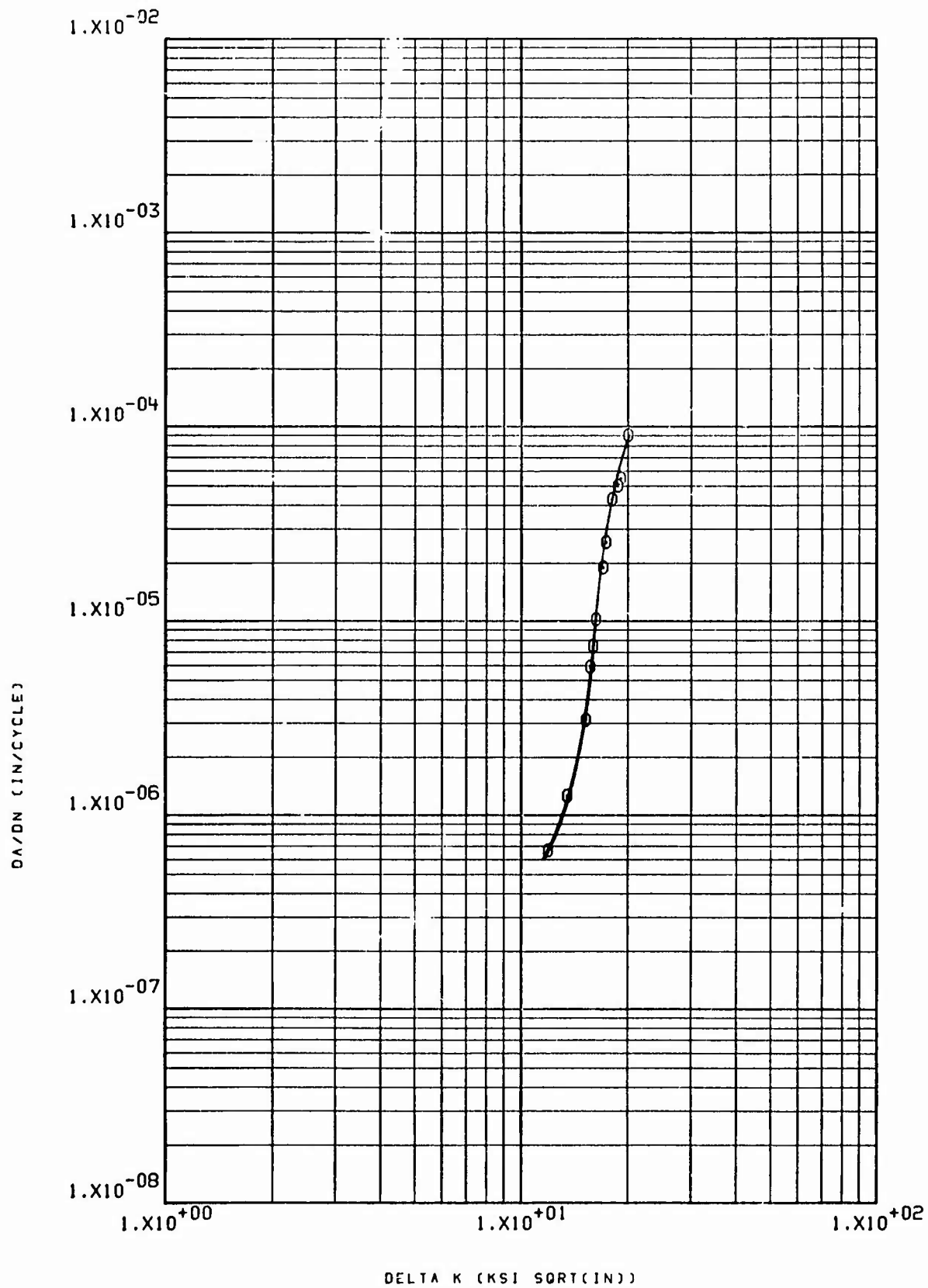


25 NRW 71-10 7049-T7352 LHA RT R=.08 360CPM

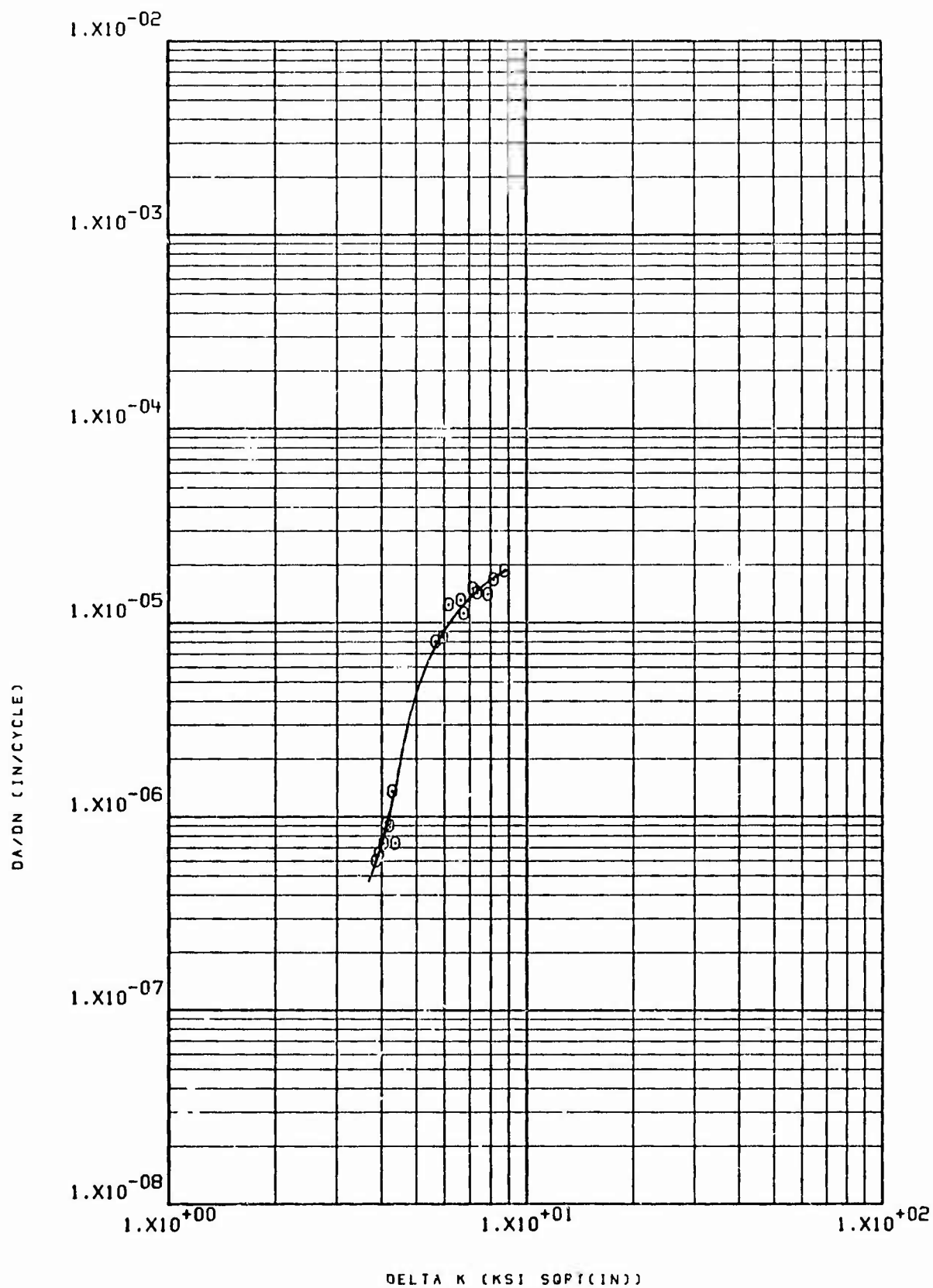
B-112

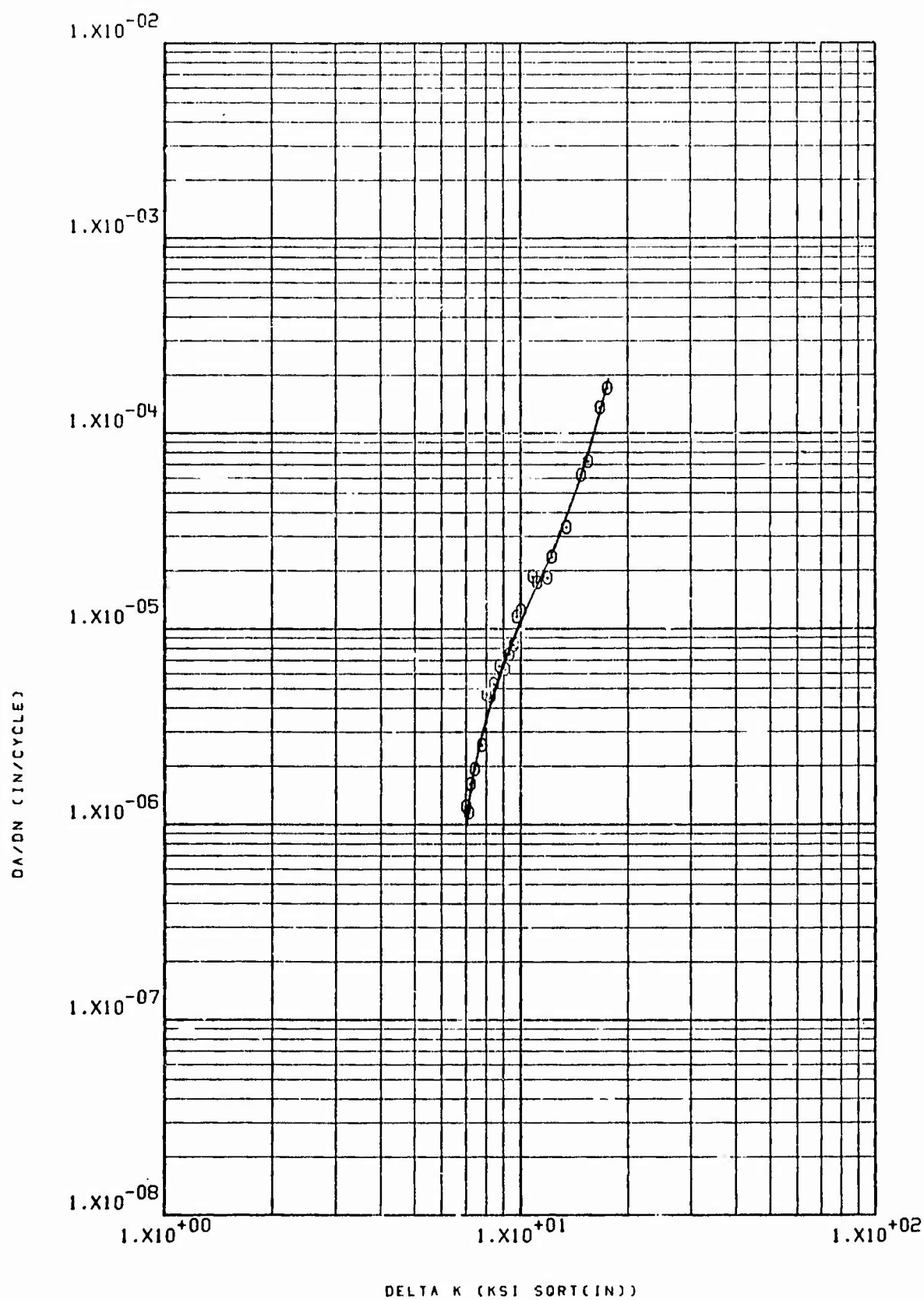


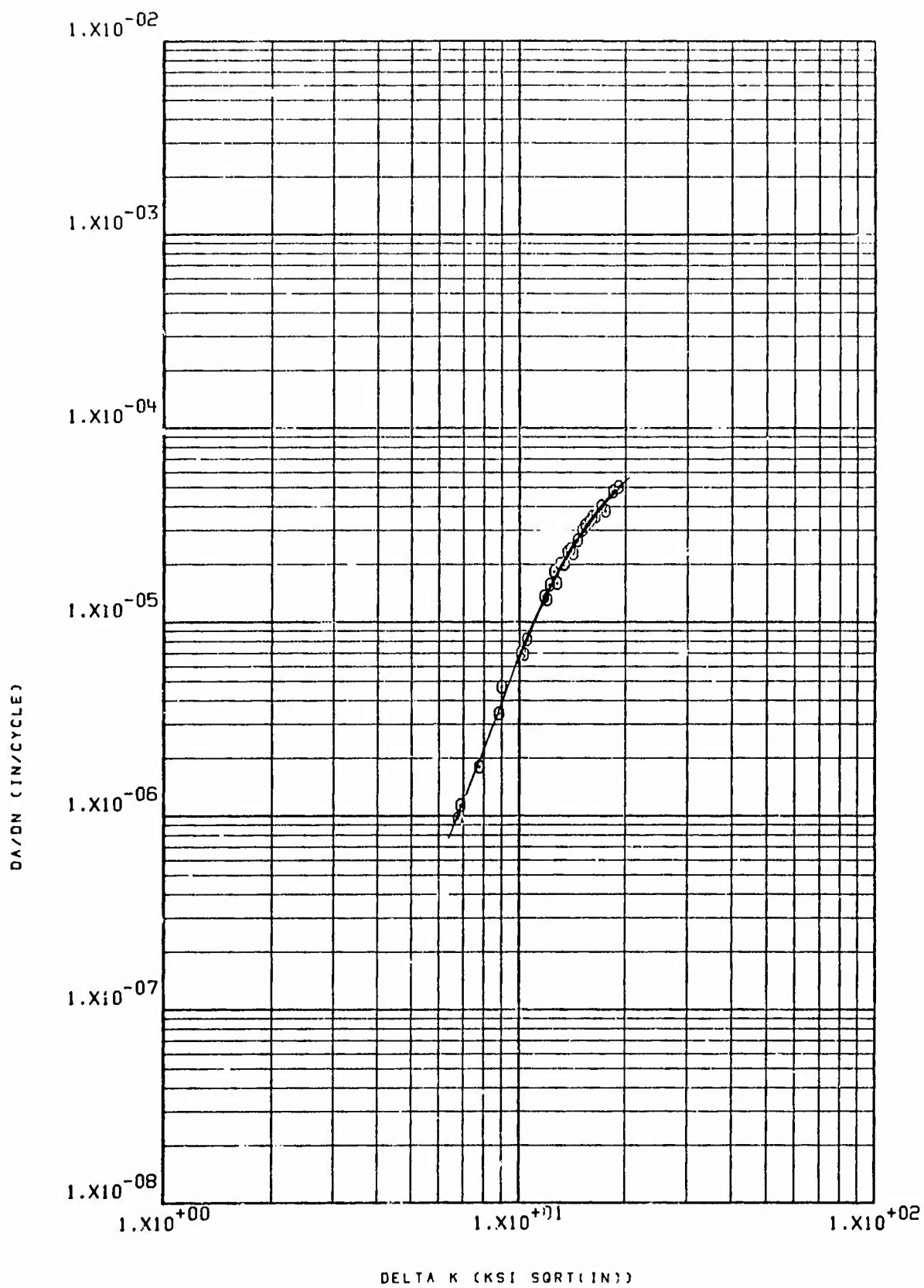
25 NWR 71-11 7049-T-7352 HAND FORGING SUMP R.T. R=.08 60CPM



25 NWR 71-12 7049-17352 ALUM LHA RT R=.08 360CPH

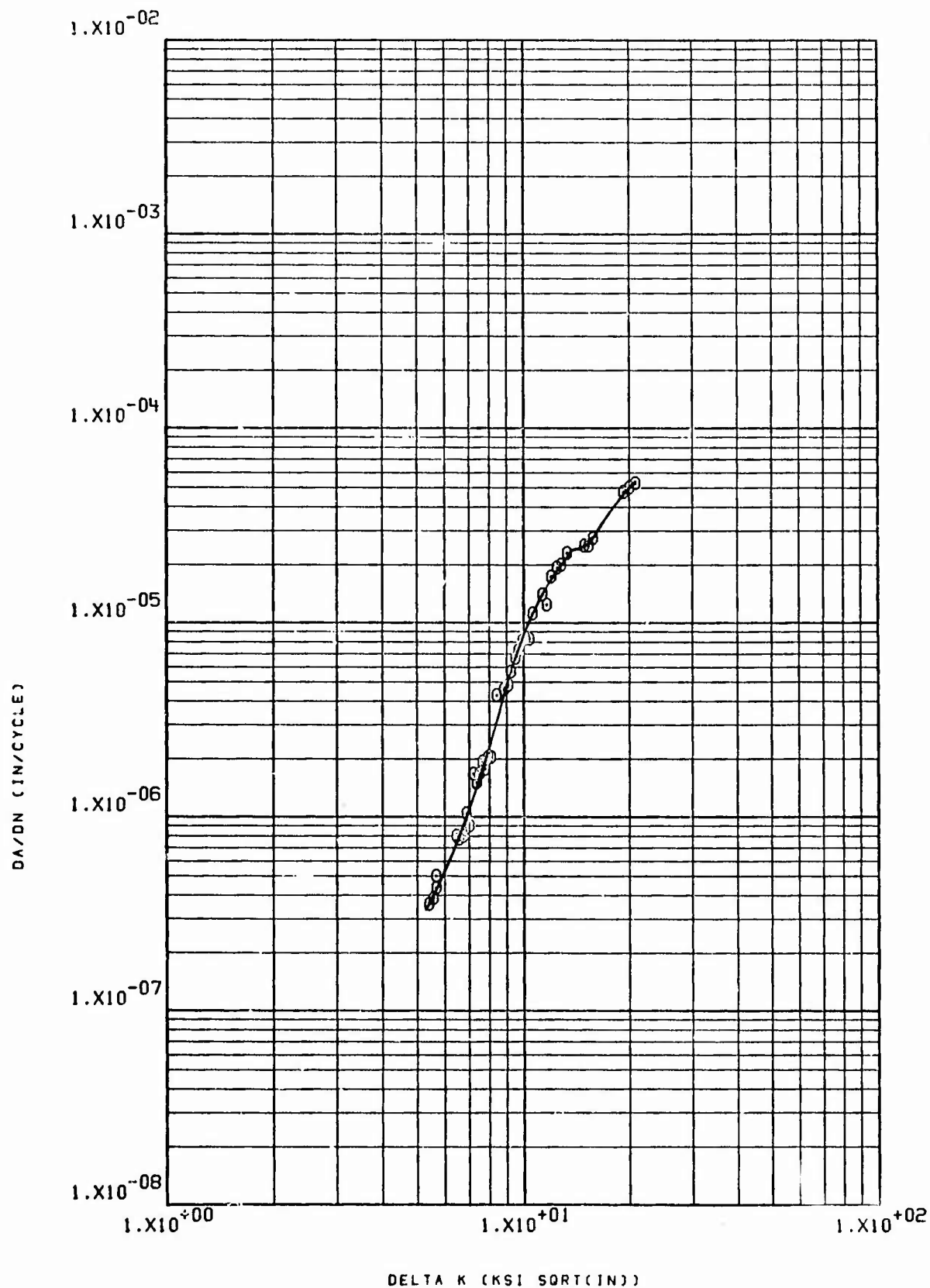




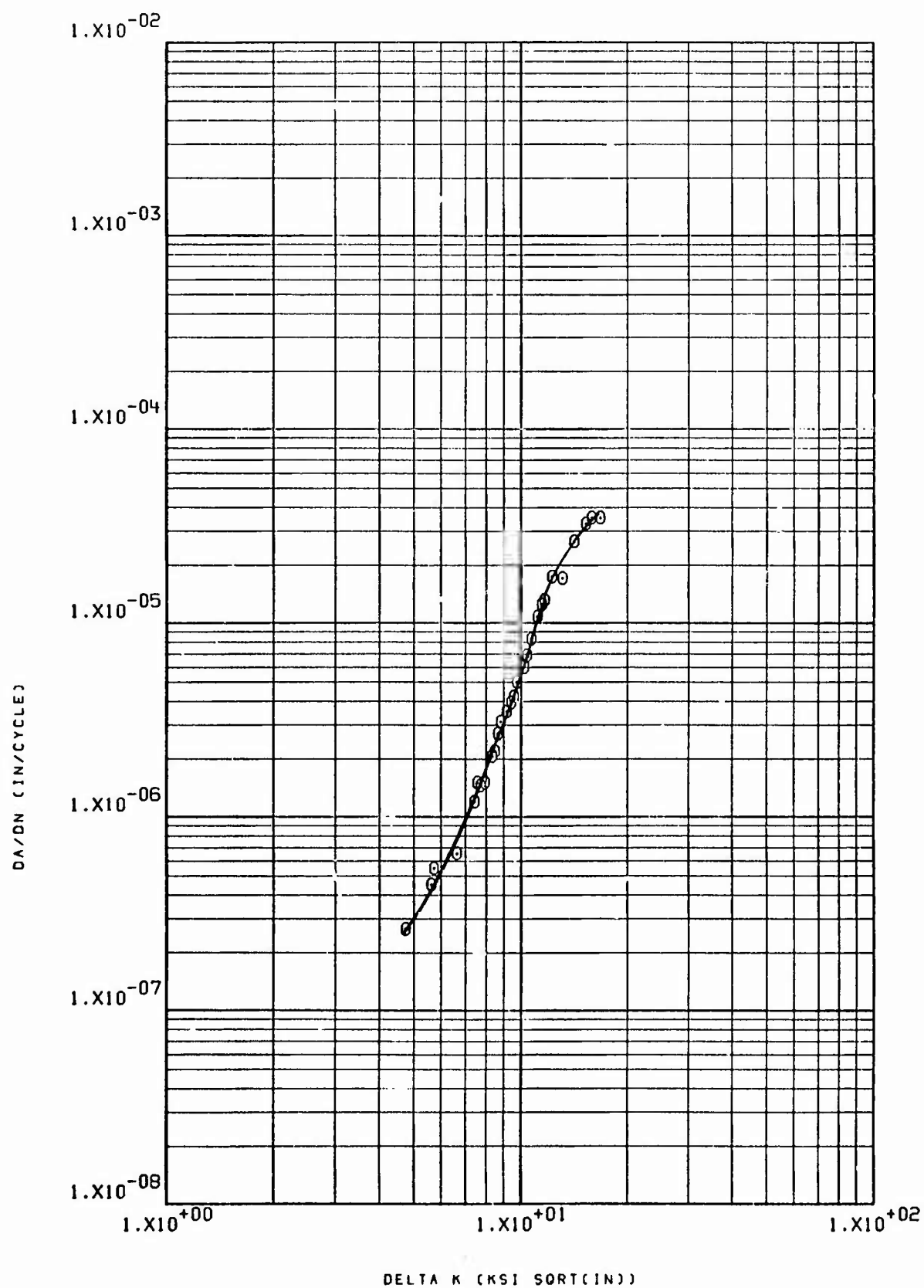


26 NRW 72-27 7175-173652 LHA RT R=.08 6CPH

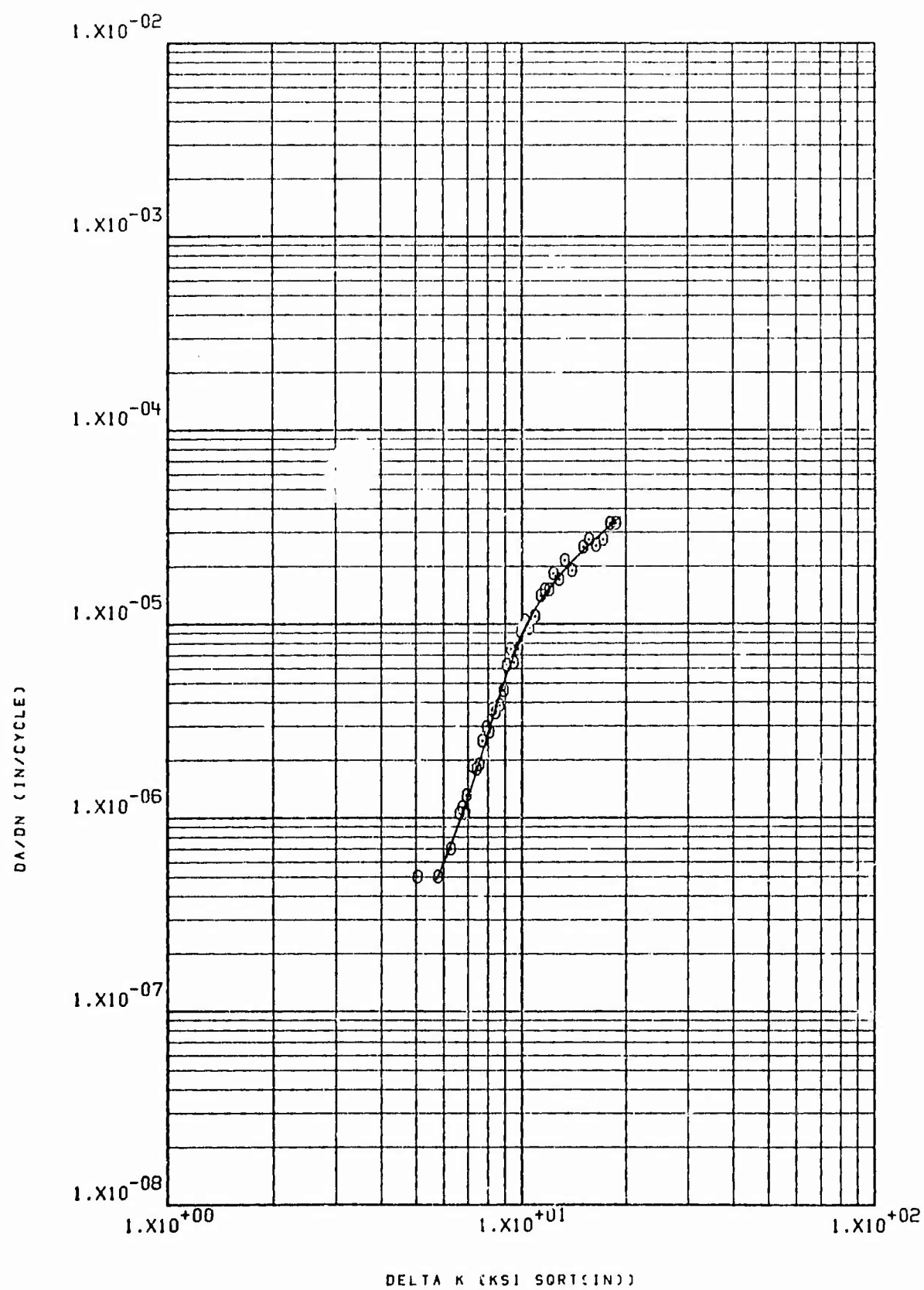
B-117



26 NRW 72-28 7175-173652 (HAND FORGING) LHA RT R=.08 CPM=60

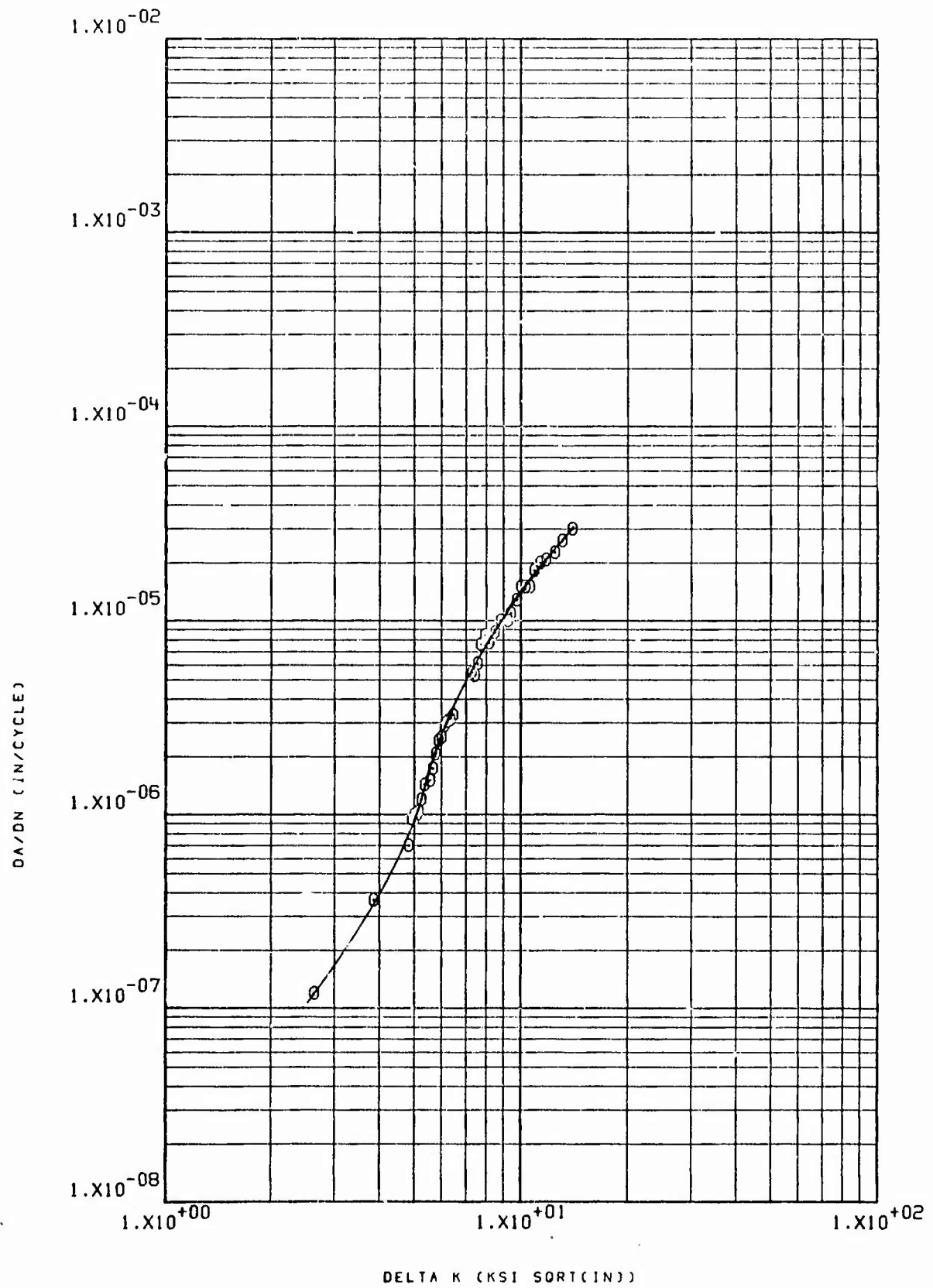


26 NRW 72-29 7175-173652 FORGING LHA RT R=.08 360CPM

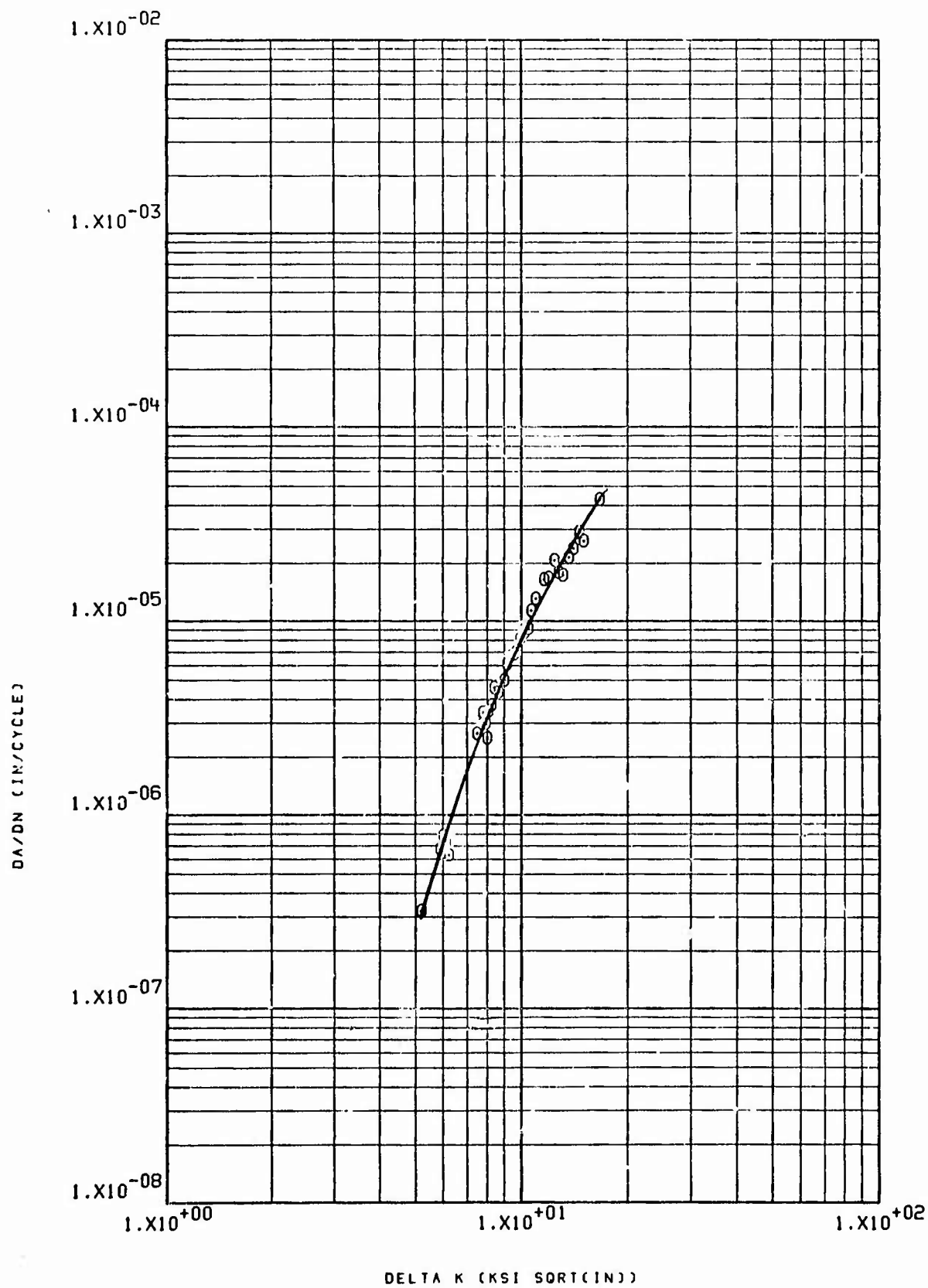


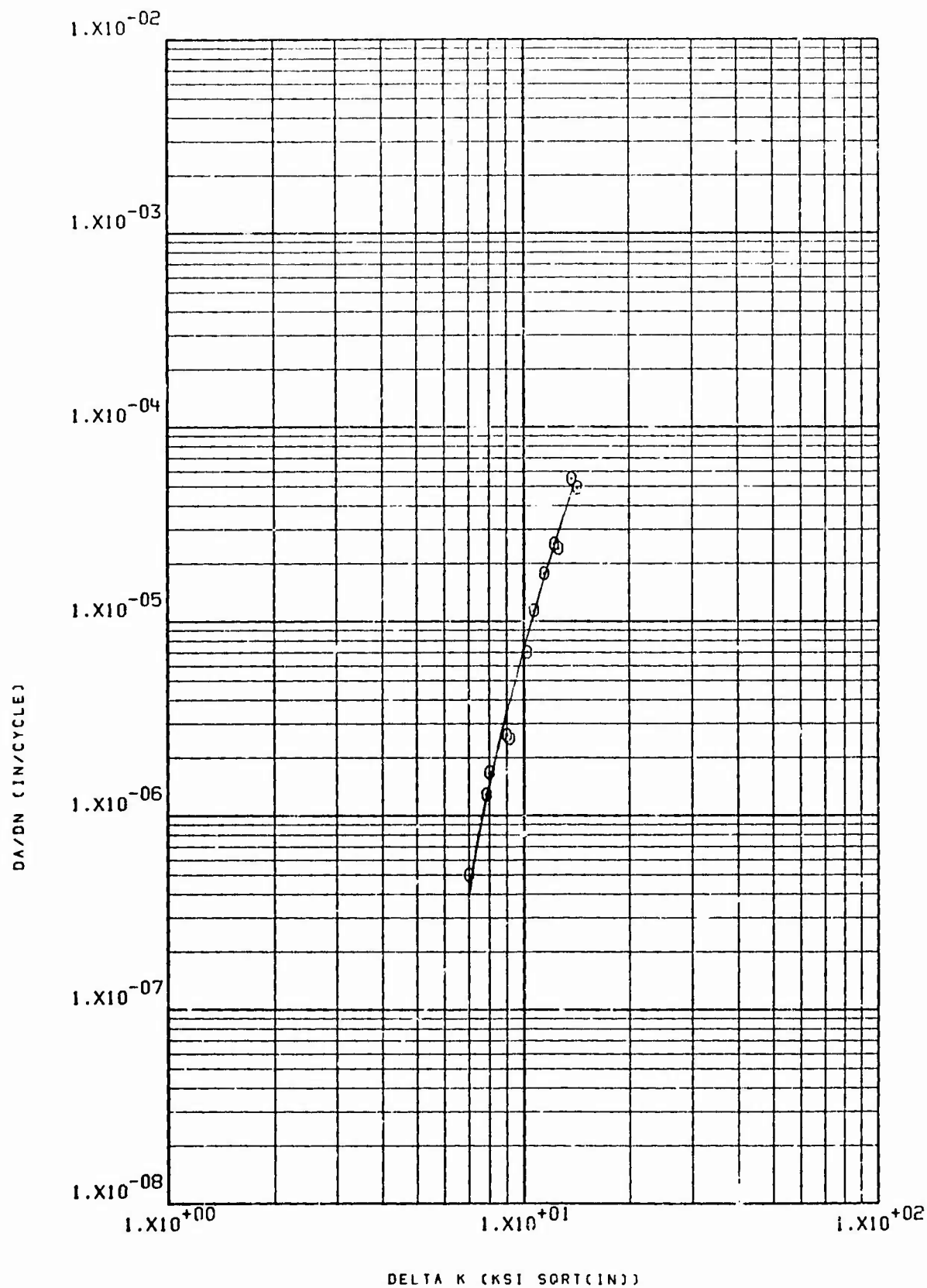
26 NRW 72-30 7175-173652 FORGING LHA RT R=.3 360CPM

B-120



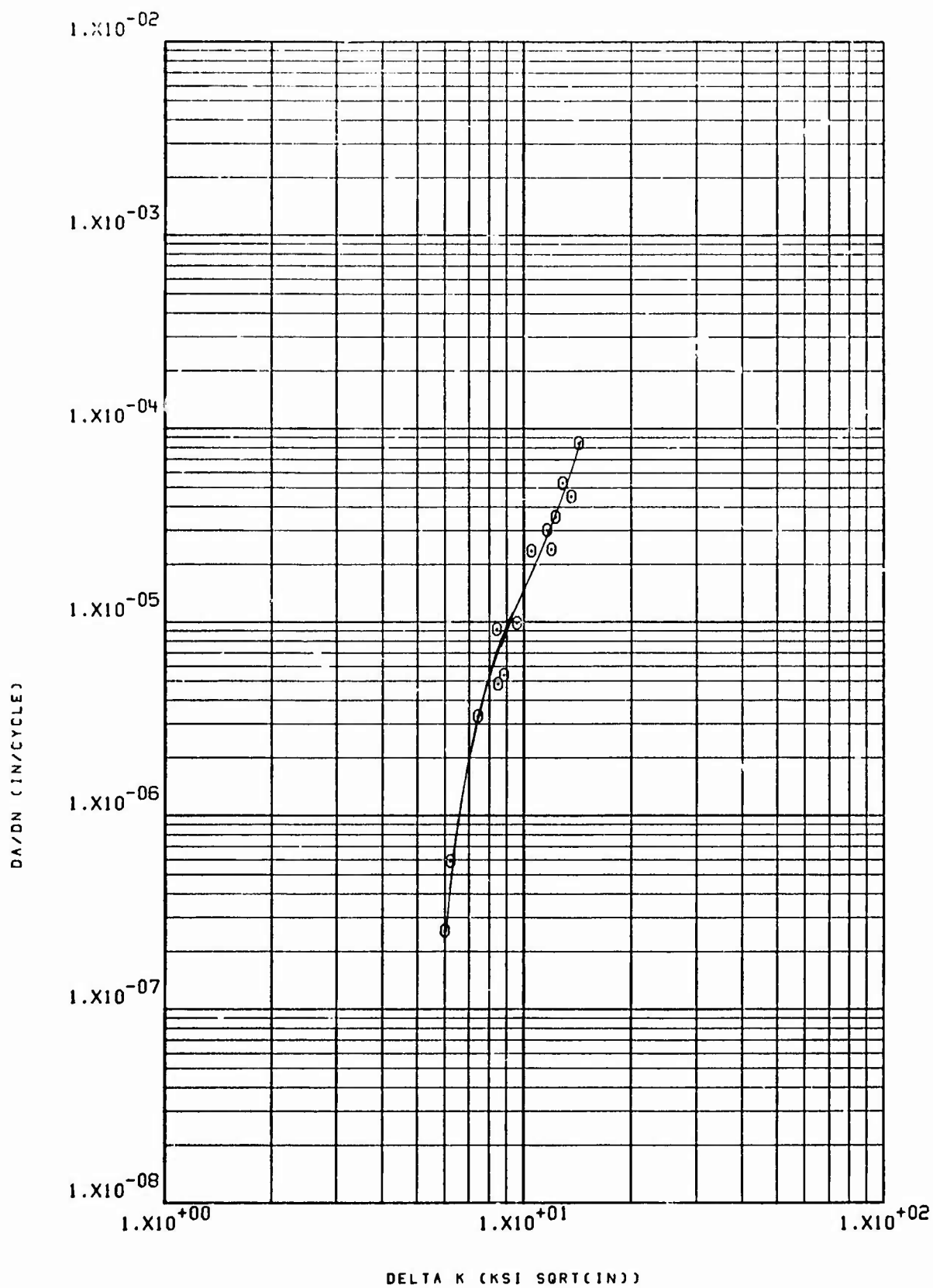
26 NRW 72-31 7175-T73652 FORGIN LHA RT R=.5 360CPH

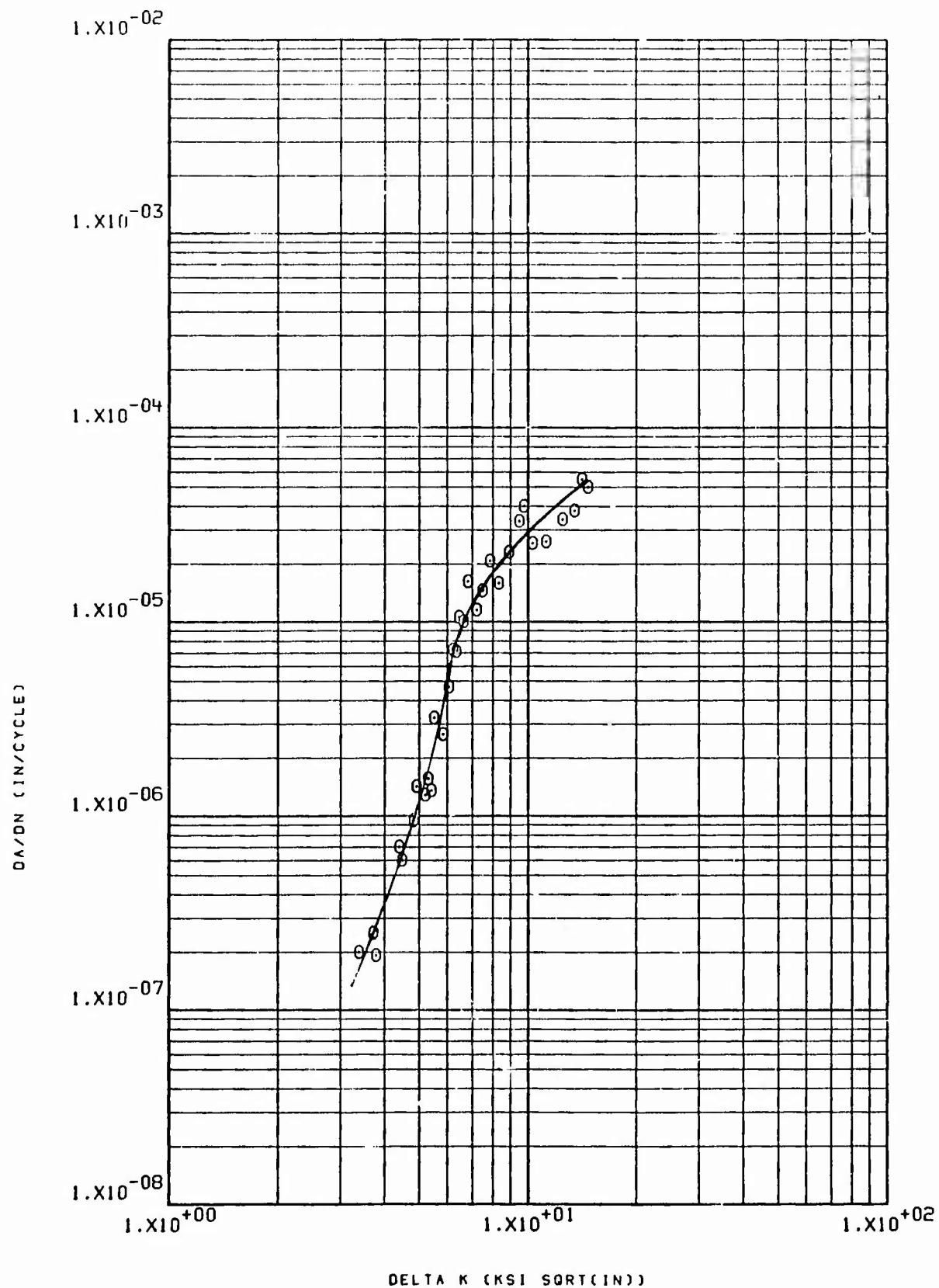




26 NRW 72-33 7175-T73652 SUMP RT R=.08 6CPM

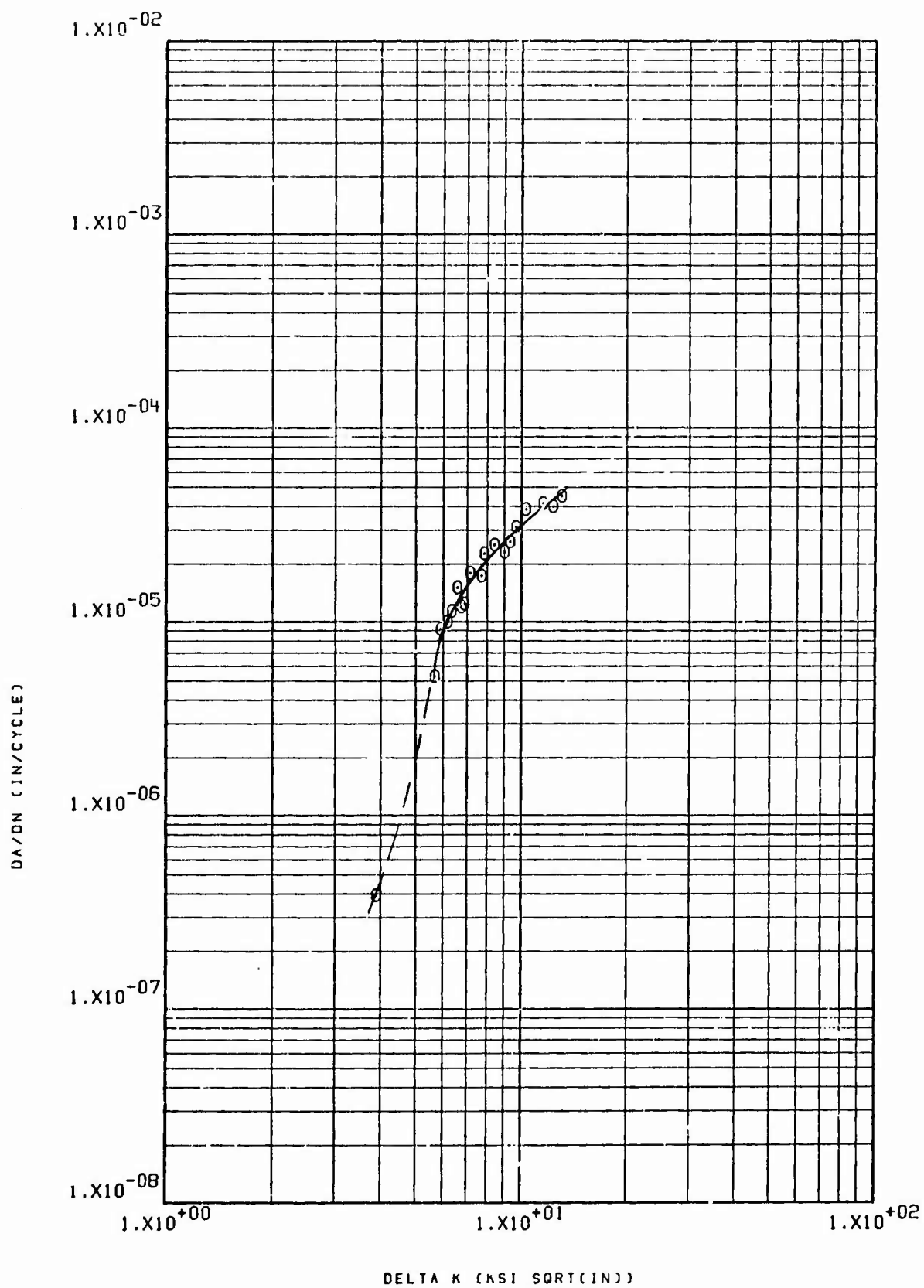
B-123





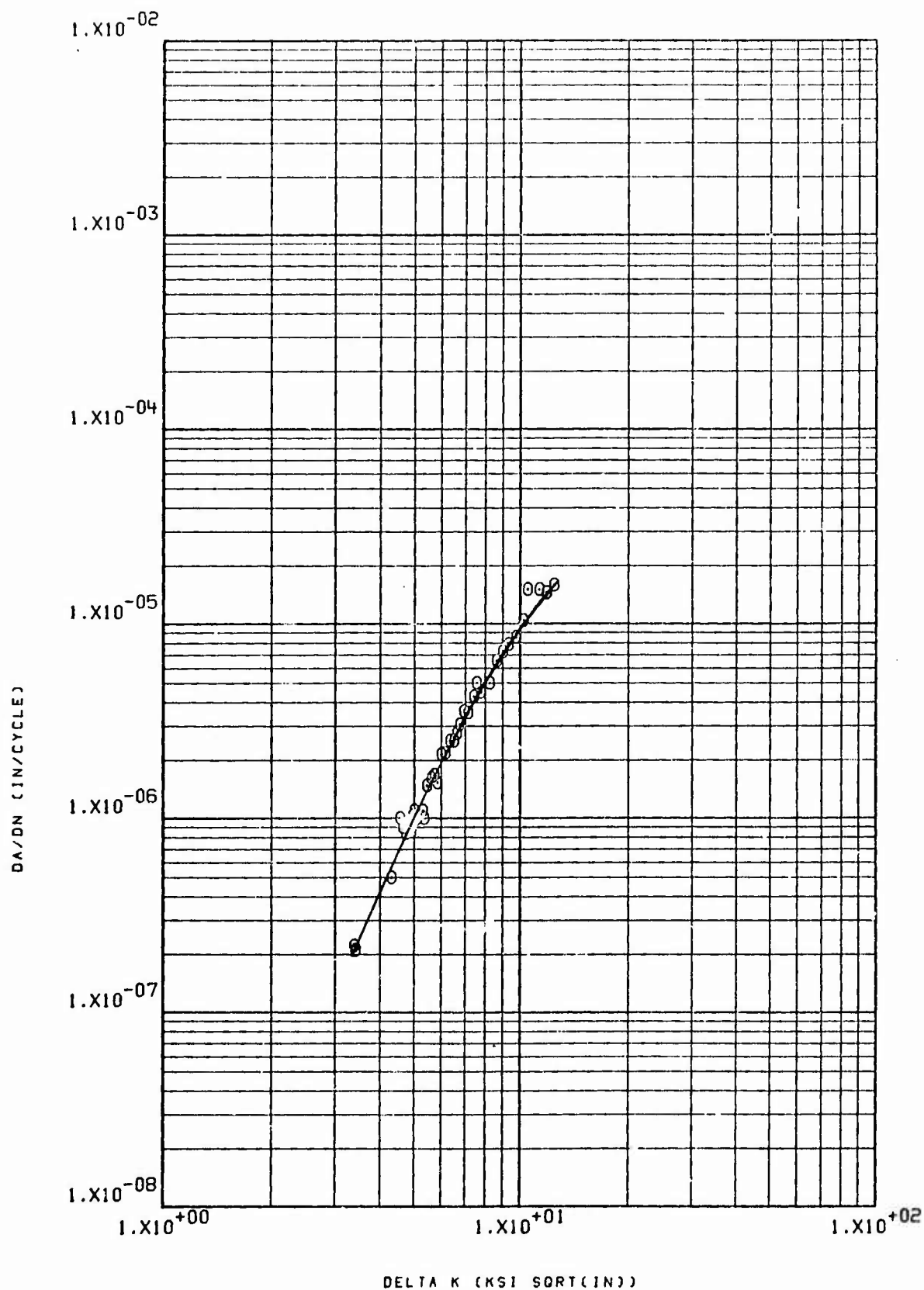
26 NRW 72-35 7175-173652 ALUMHAND FORGING SUMP RT R=.3 60CPM

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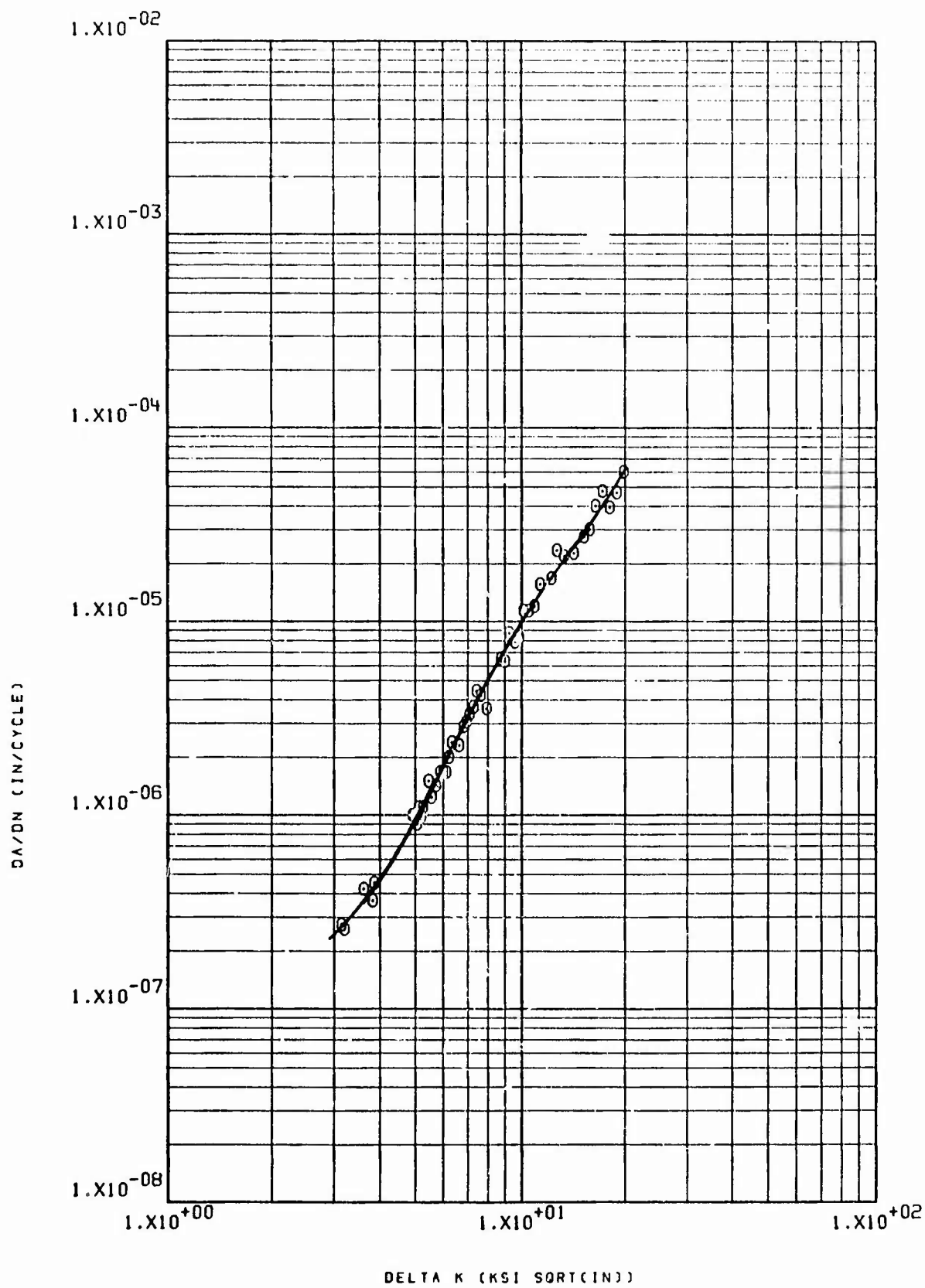
26 NRW 72-36 7175-T73652 ALUM HAND FORGE SUMP RT R=.5 60CPM

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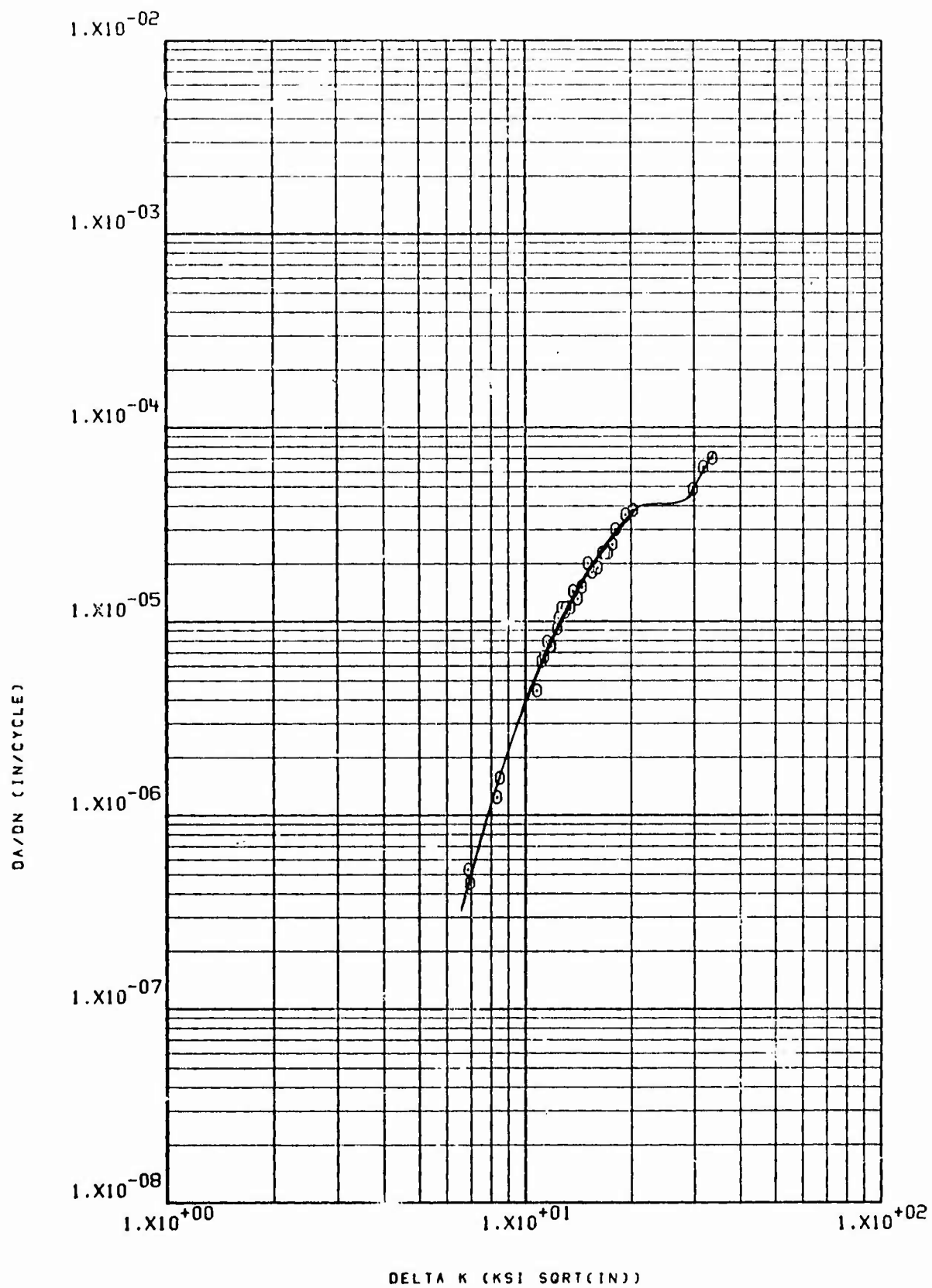
26 NRW 72-37 7175-T73652 AL HD FRGE SCS RT 60CPM R=.03

B-127

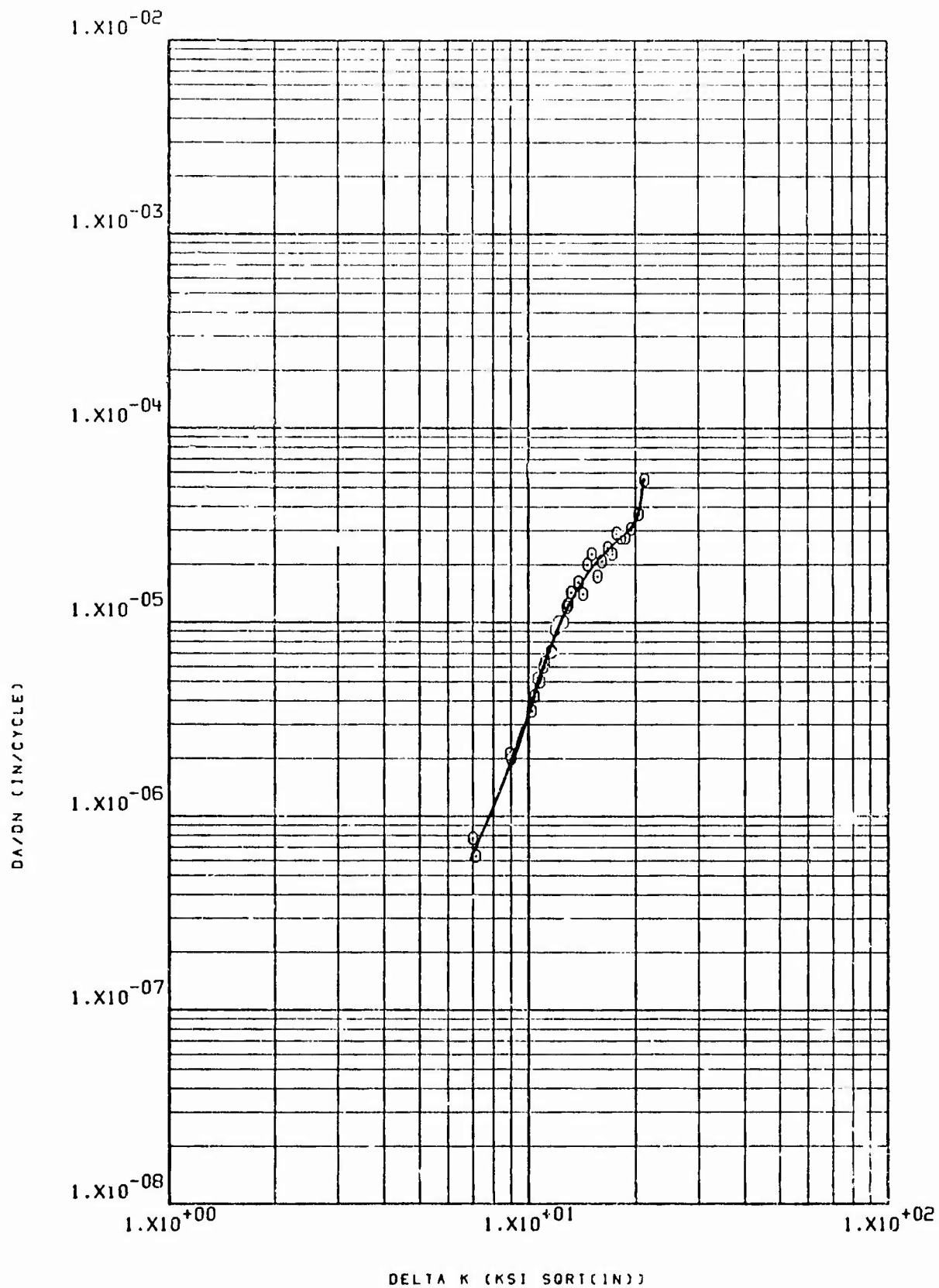


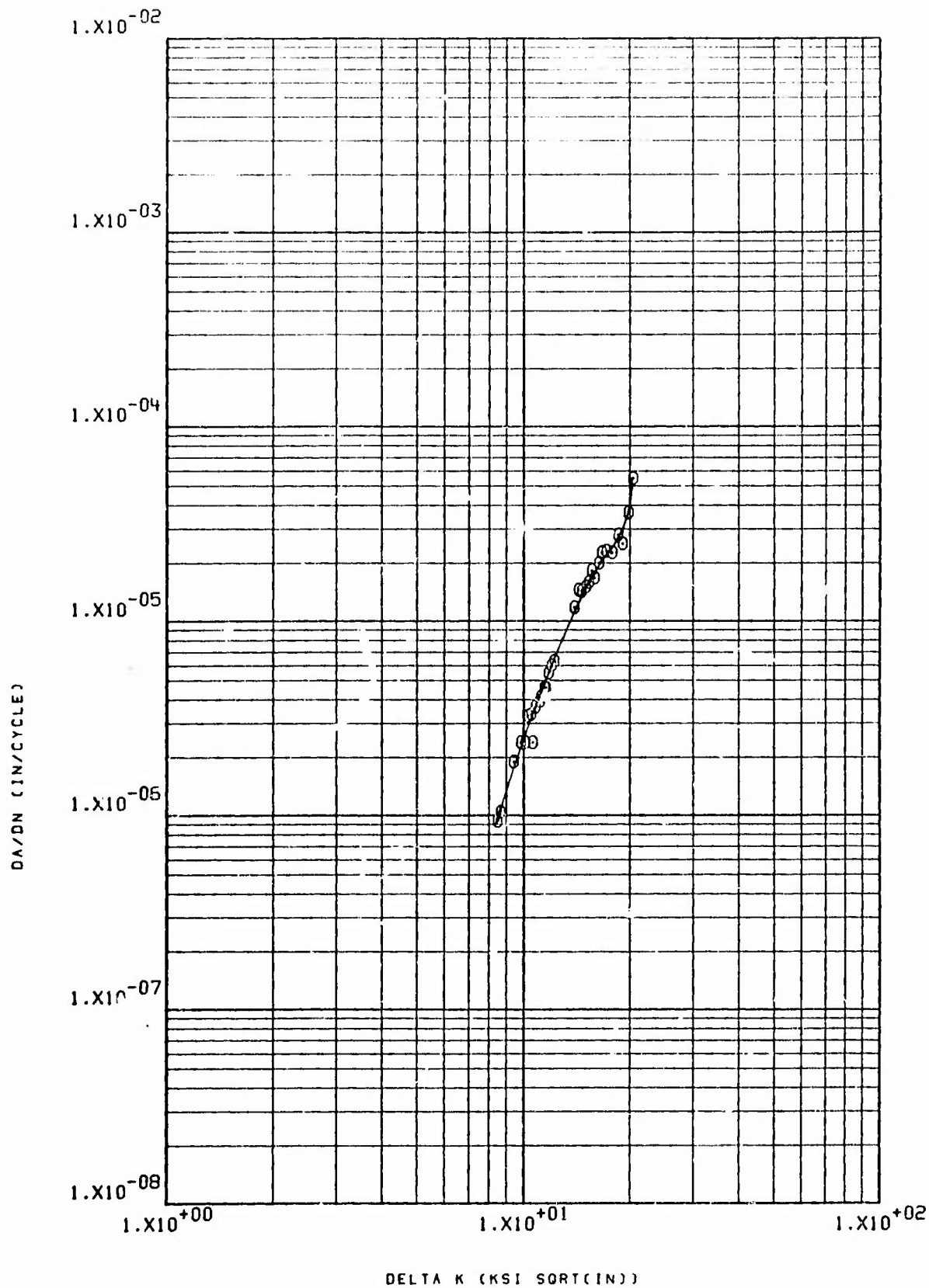
26 NRW 72-38 7175-173652 AL HD FFG FIELD

RT R=.08 60CPM



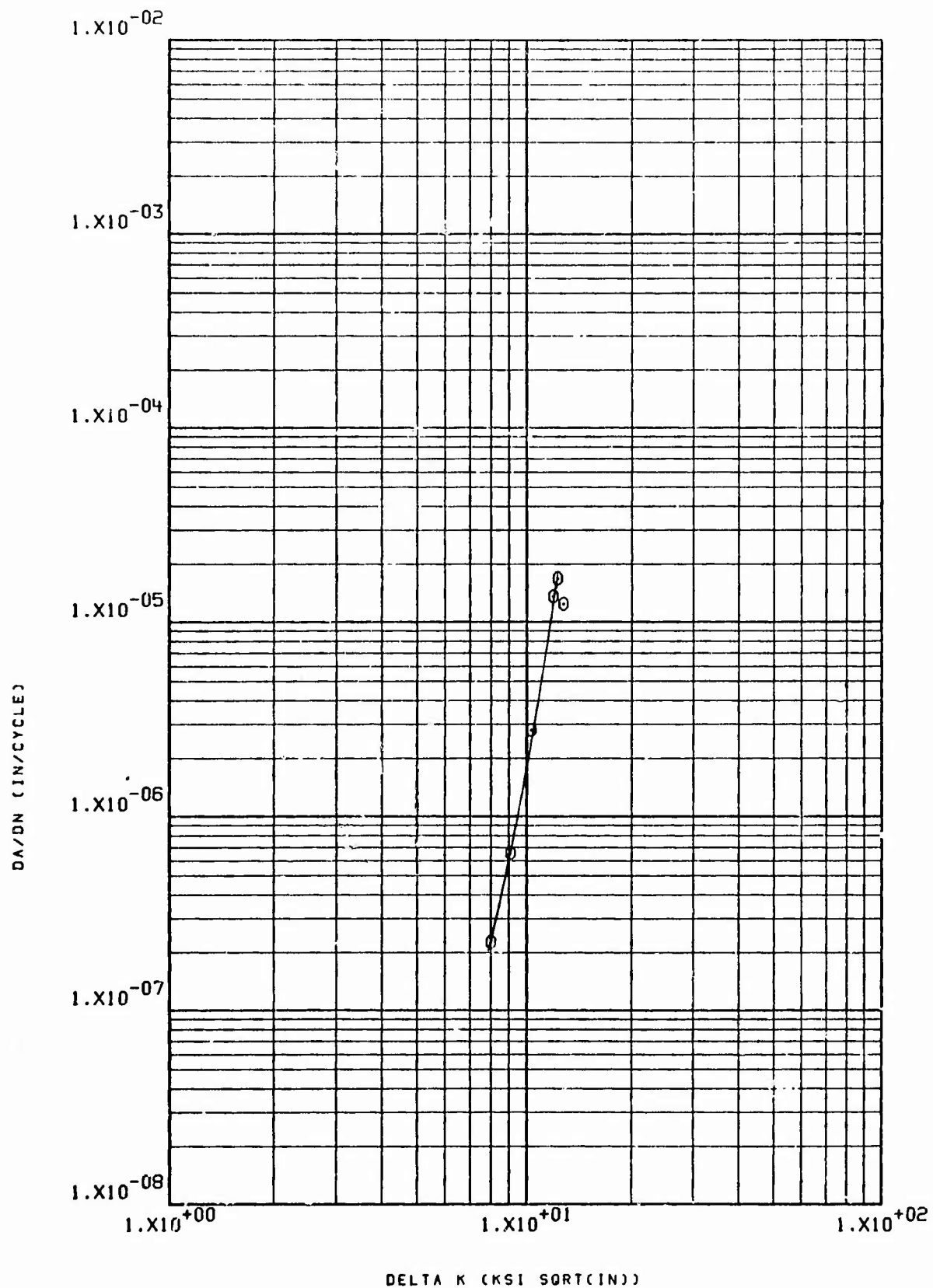
26 NRW 72-40 7175-173652 FORGING LHA RT R=.08 360CPM



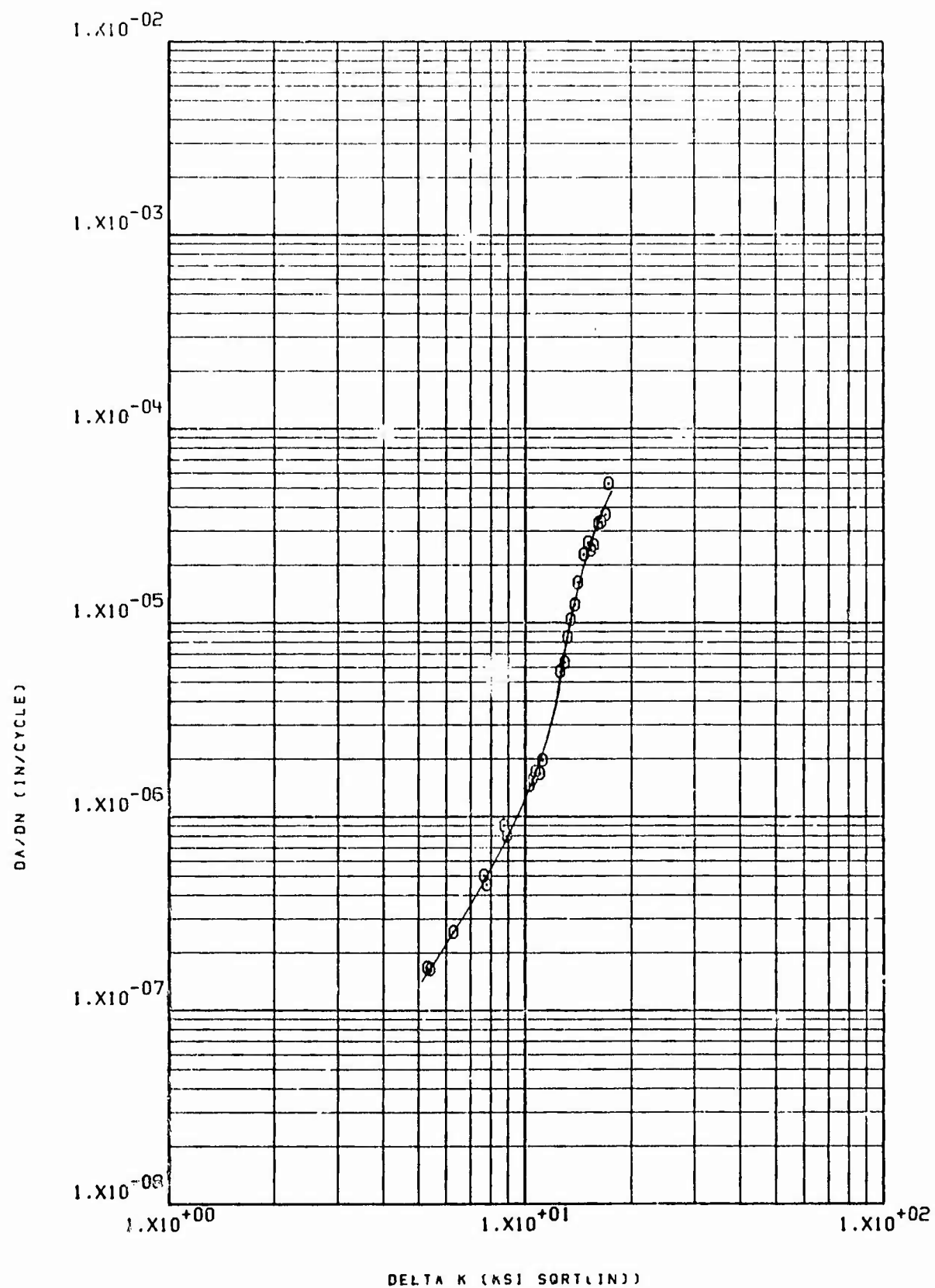


26 NWR 72-44 7175 T73652 ALUM HD FRGE LHA RT R=.08 360CPM

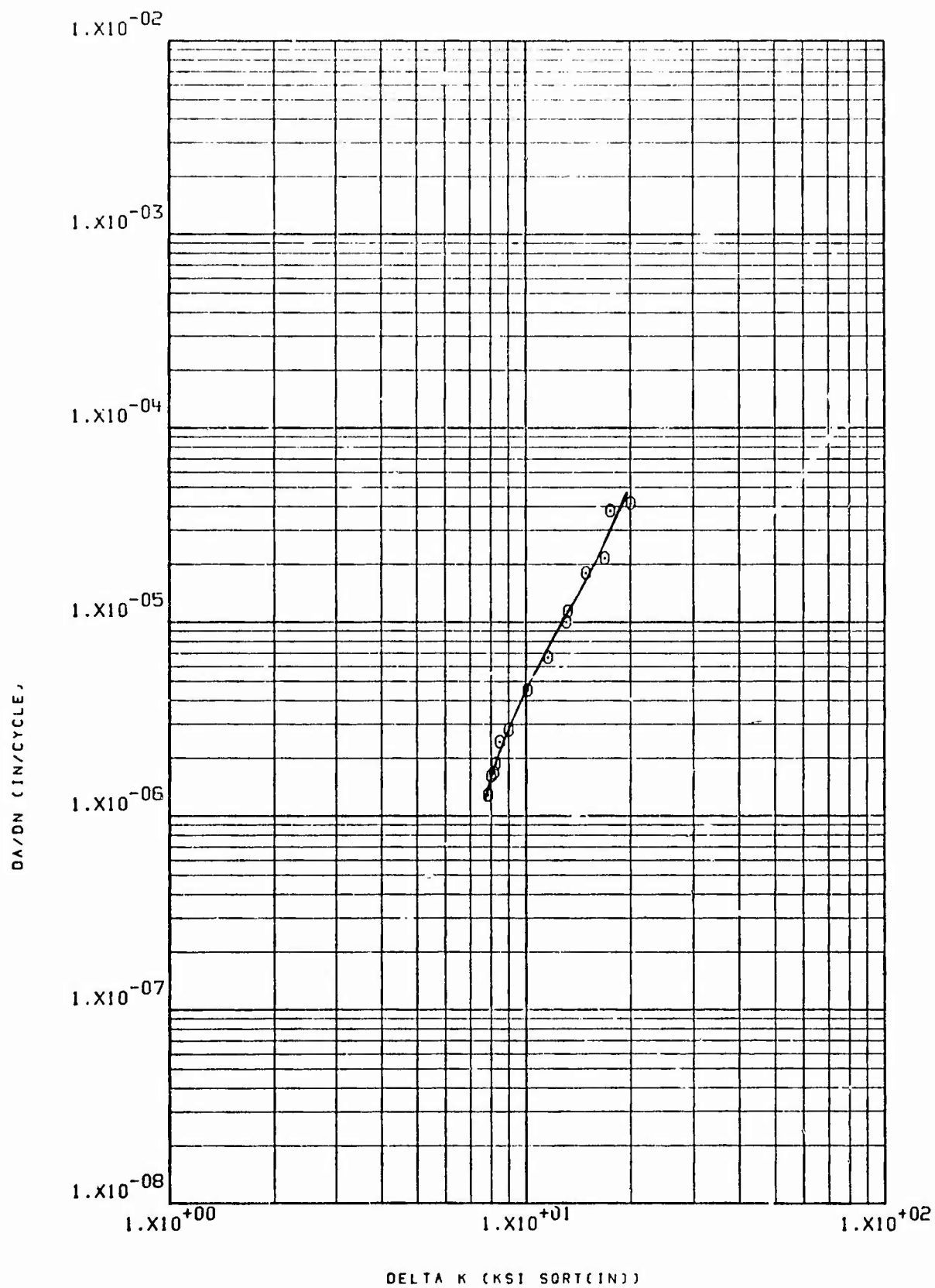
B-131



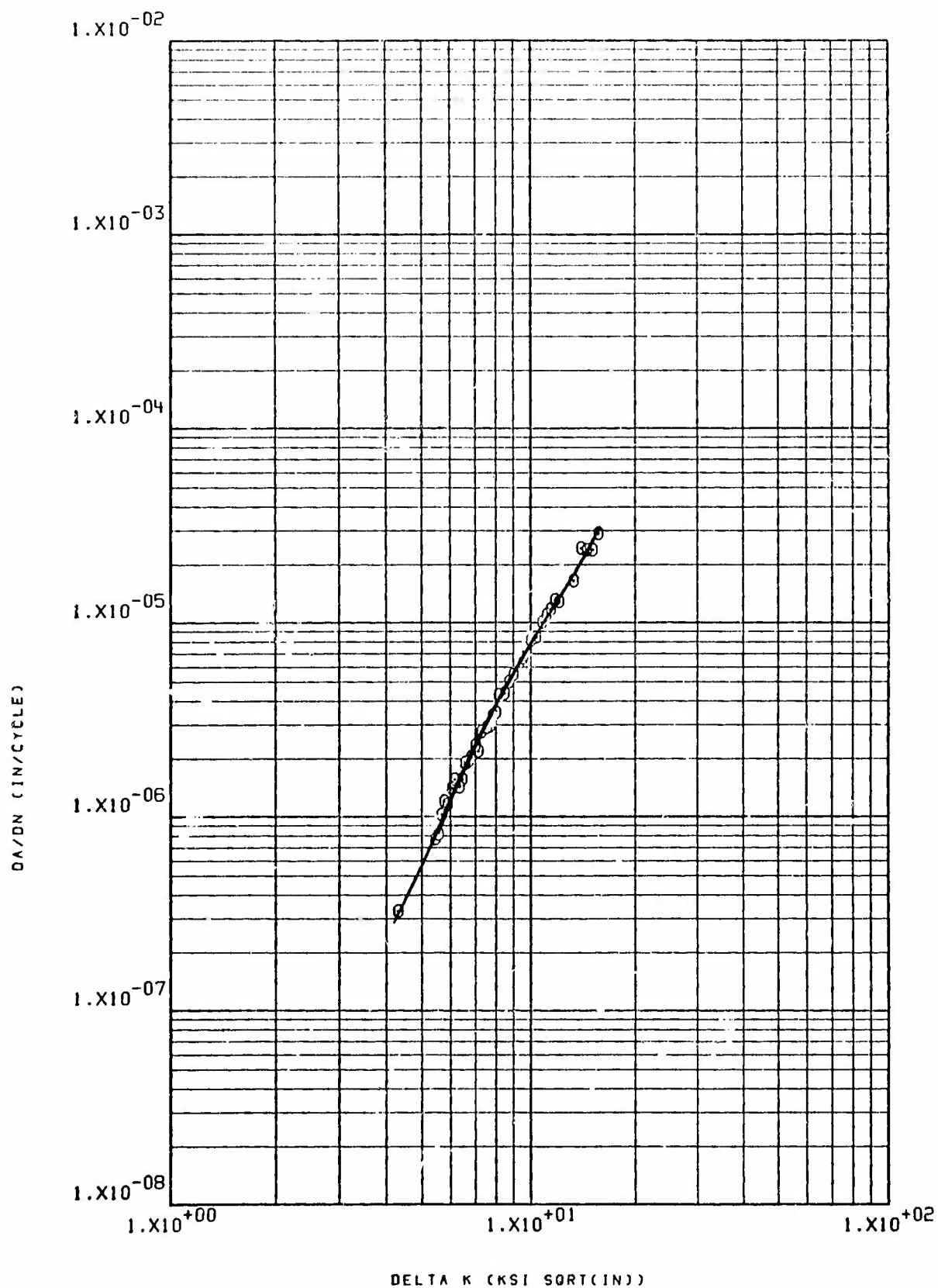
26 NWR 72-45 7175-173652 HD FDGE SUMP RT R=.08 60CPM



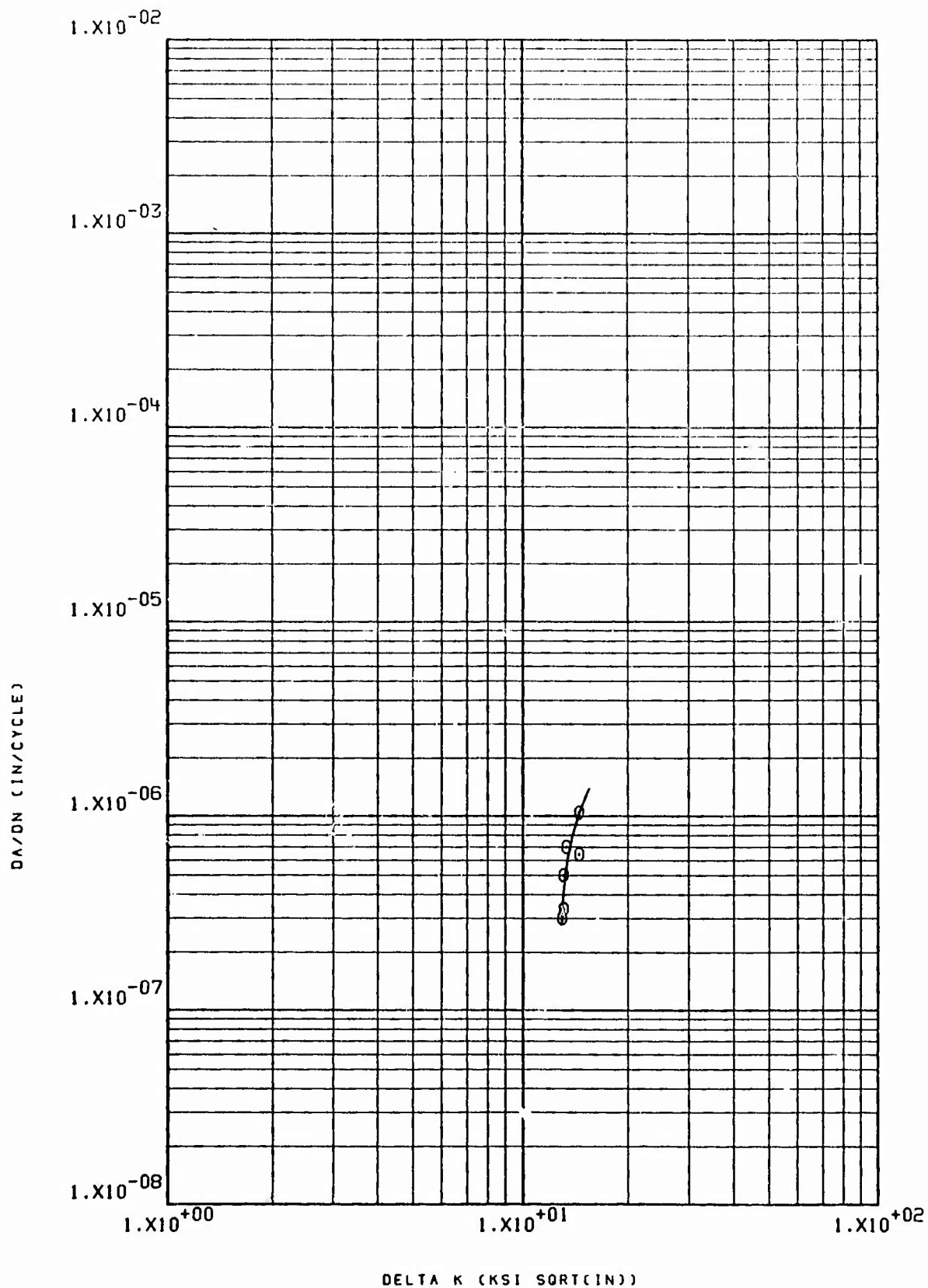
26 NWR 72-46 7175-173652 FORGING LHA PT R=.08 360CFM



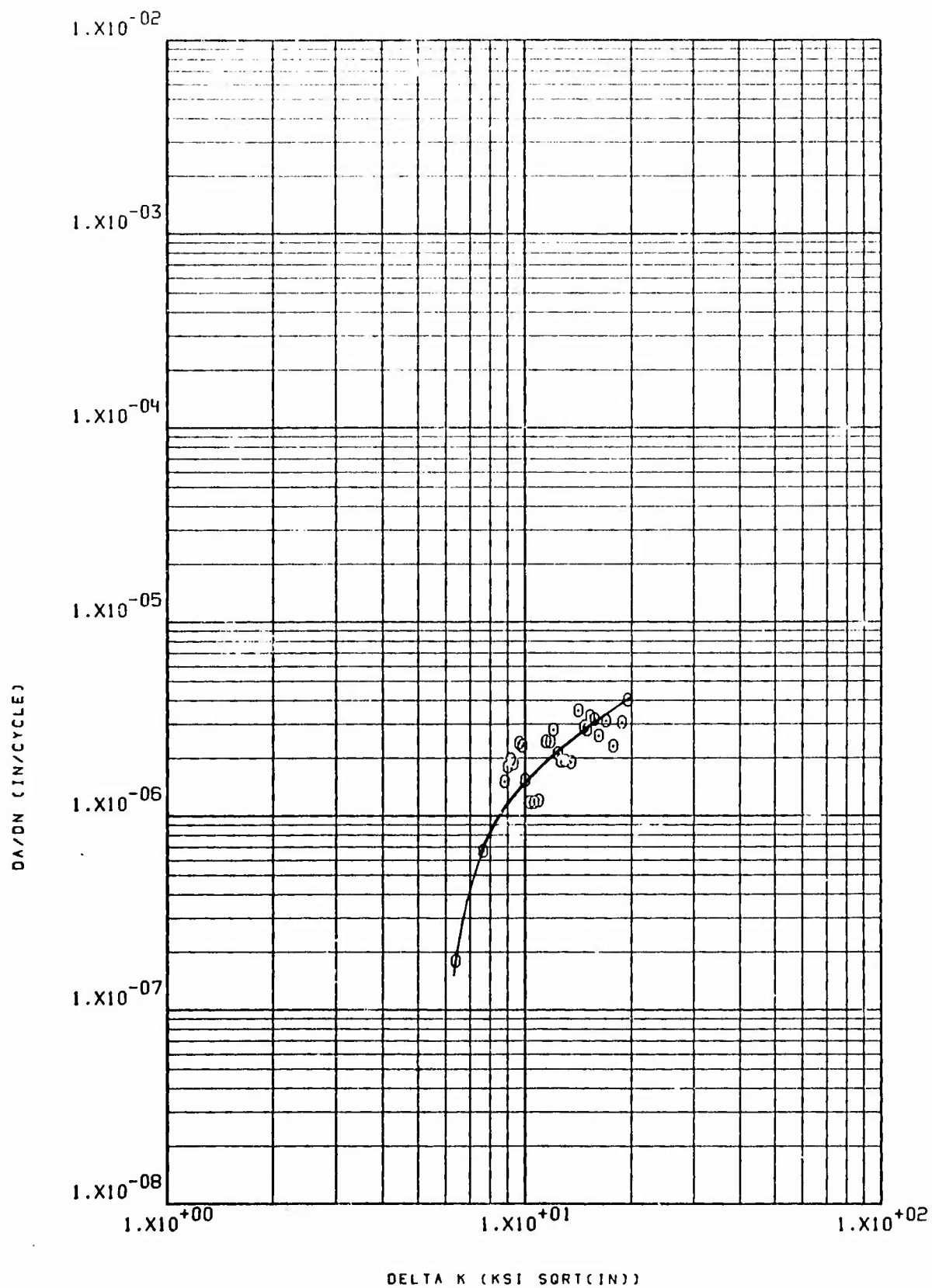
27 NRW 75-1 2024-T852 FORGING LHA RT R=.08 6CPM



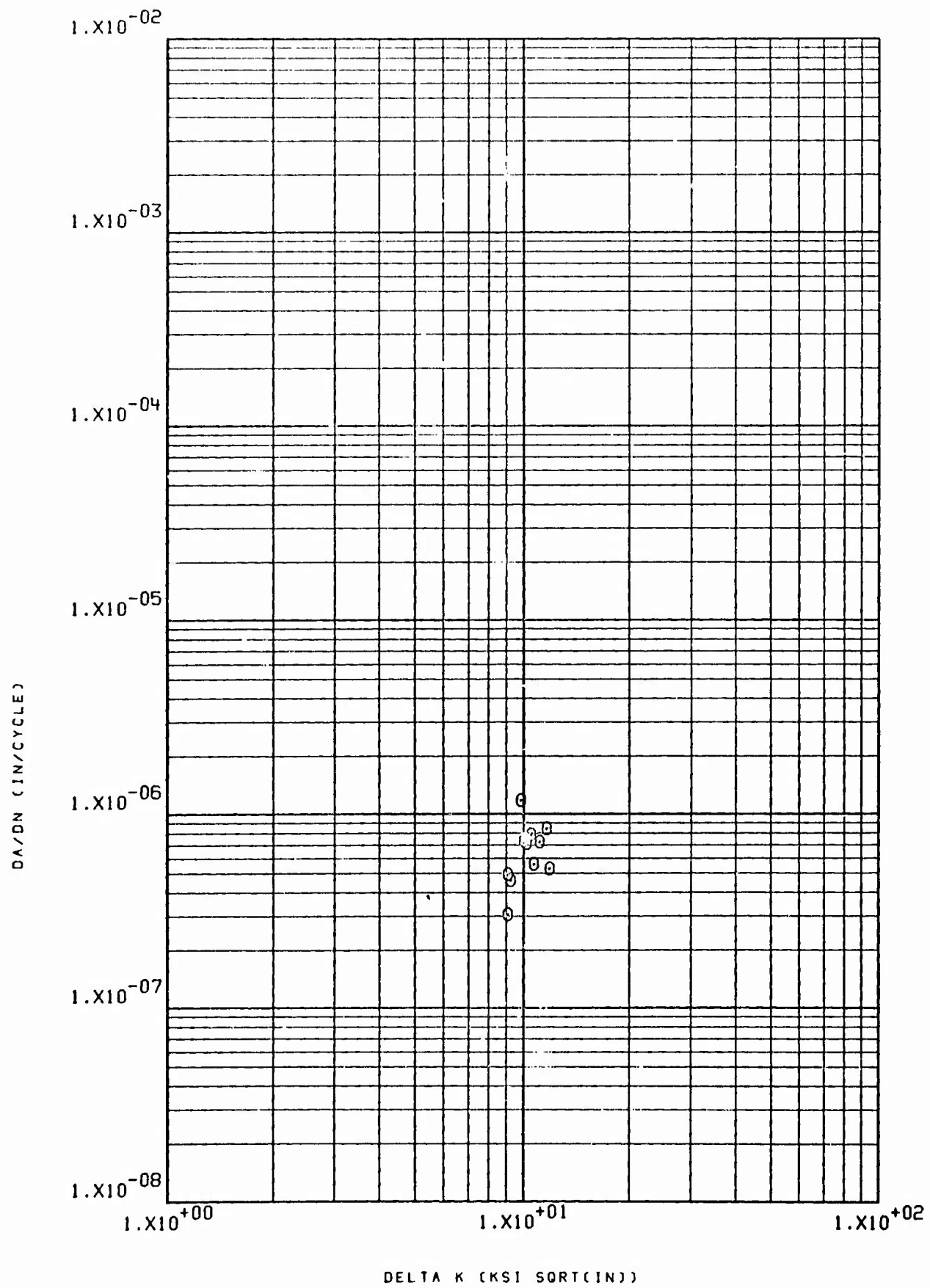
27 NRW 75-2 2024-1852 FORGING LHA 60CPH R=.08 RT

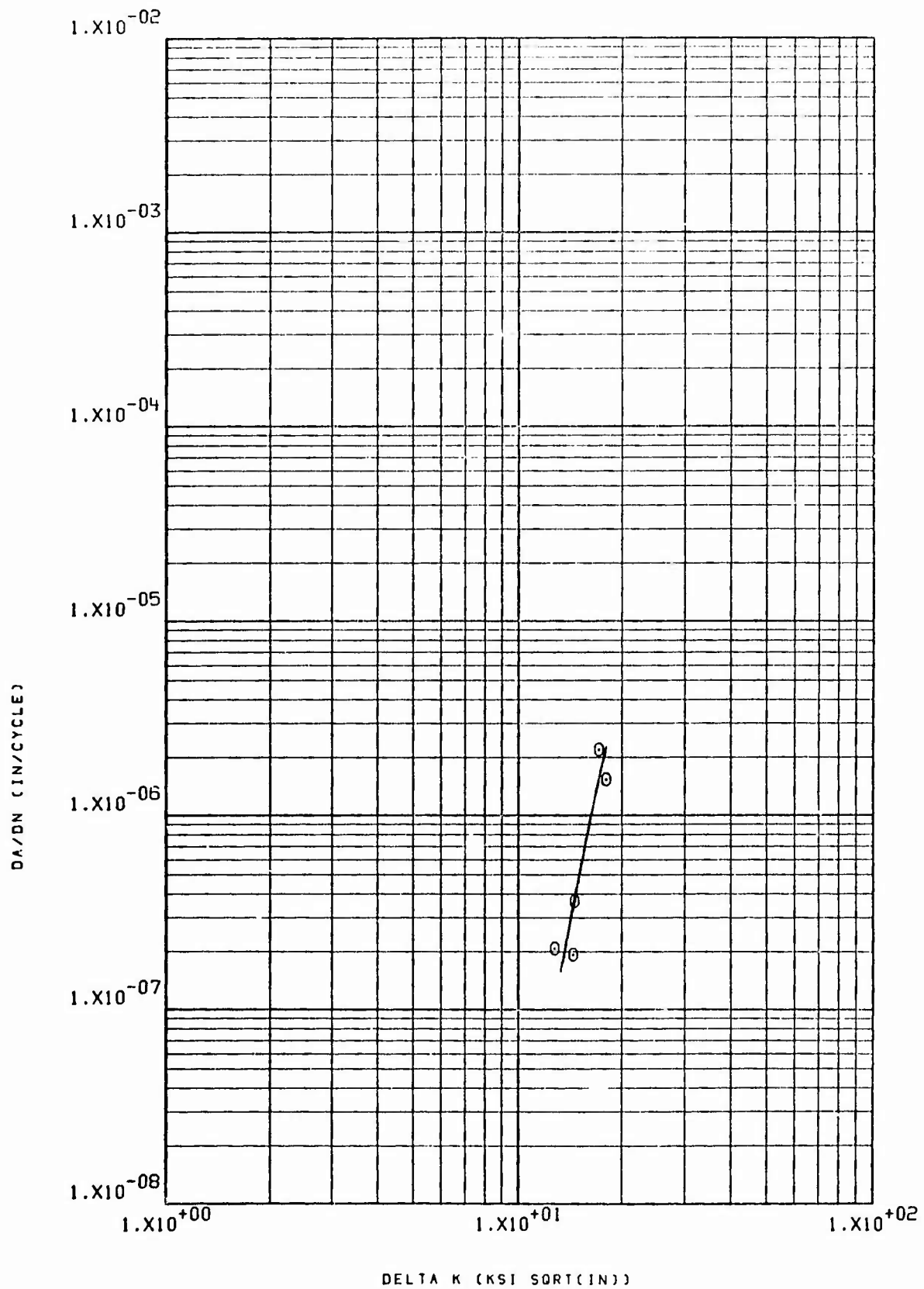


27NRW75-3 2024-1852 HD FORGE LHA RT 360CPM R=.08

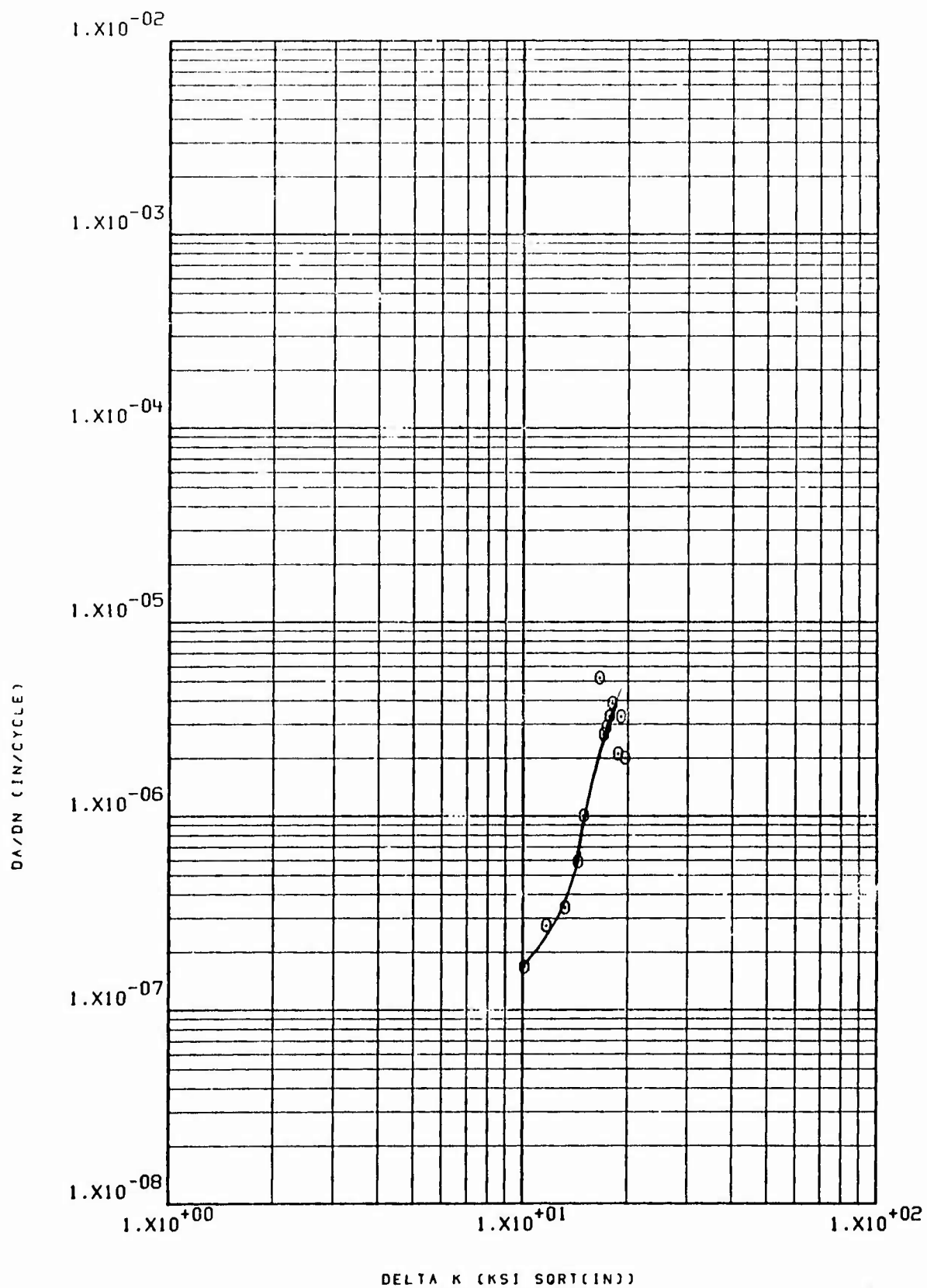


27 NRW 75-4 2024-1852 FORGING LHA RT 360CPM R=.3



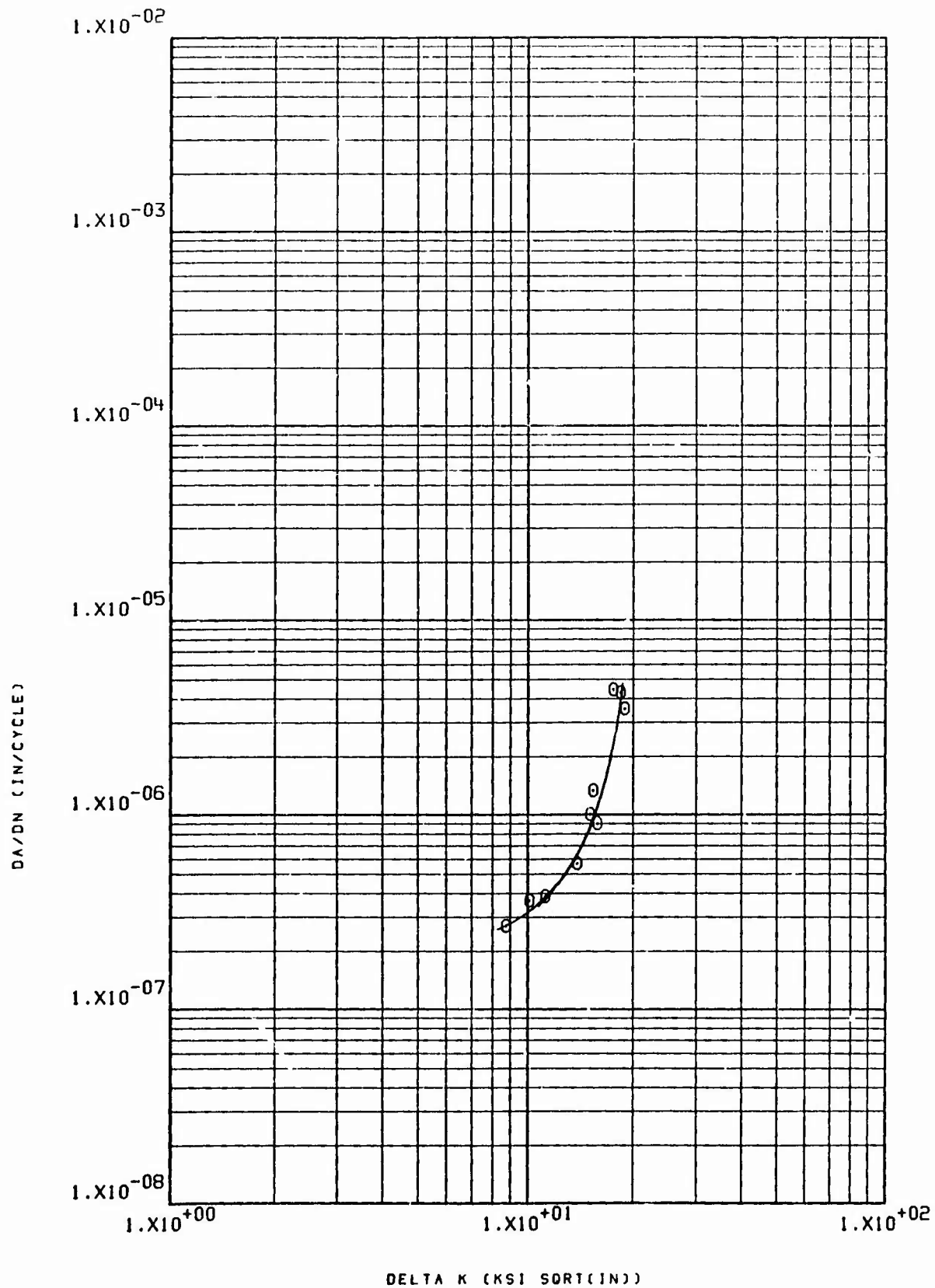


27 NRW 75-6 2024-T852 HAND FORGING FUEL RT 60CPM R=0.08

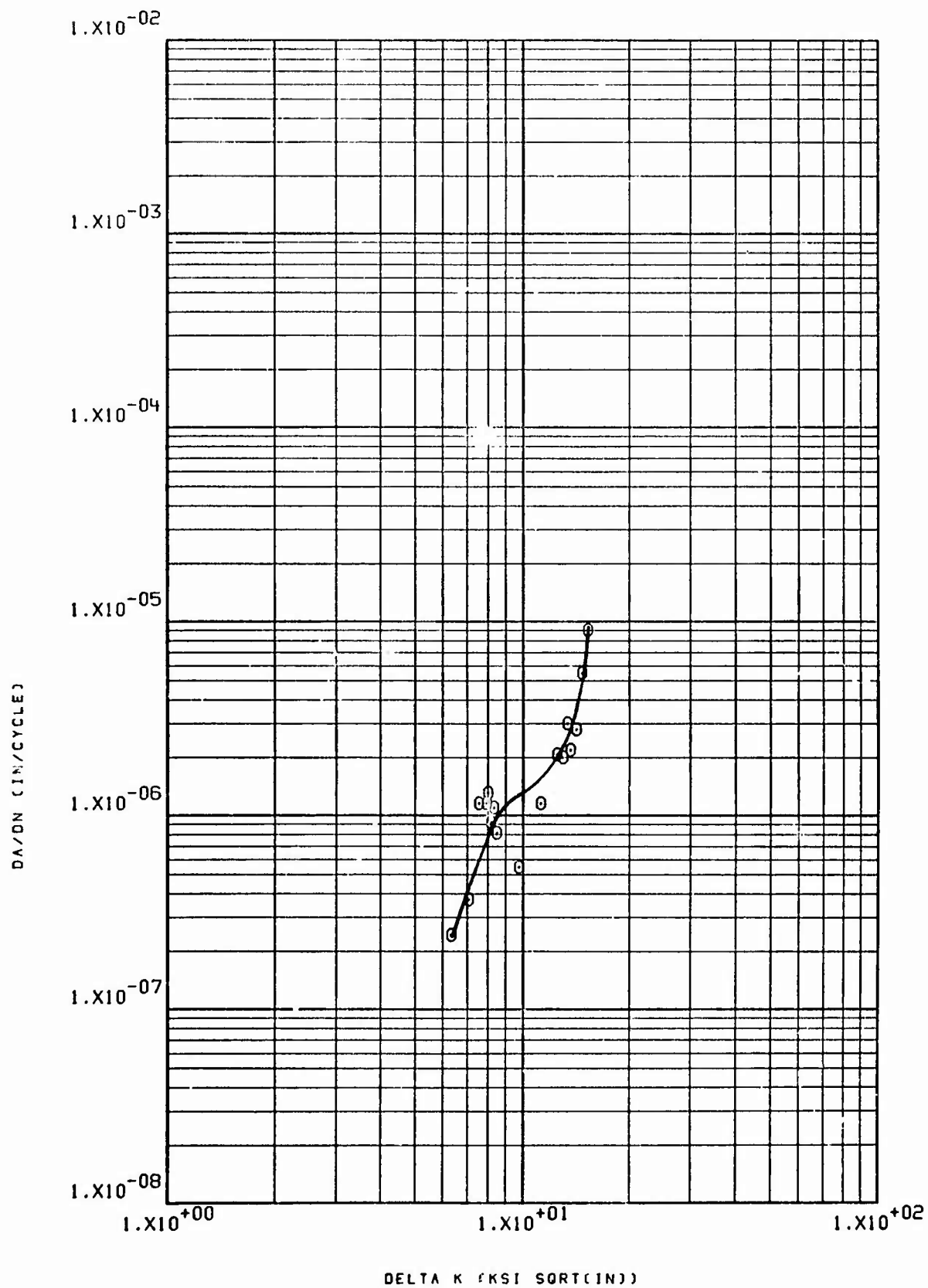


27 NRW 75-7 2024-T-852 HAND FORGING SUMP R.T. 60CPM R=.08

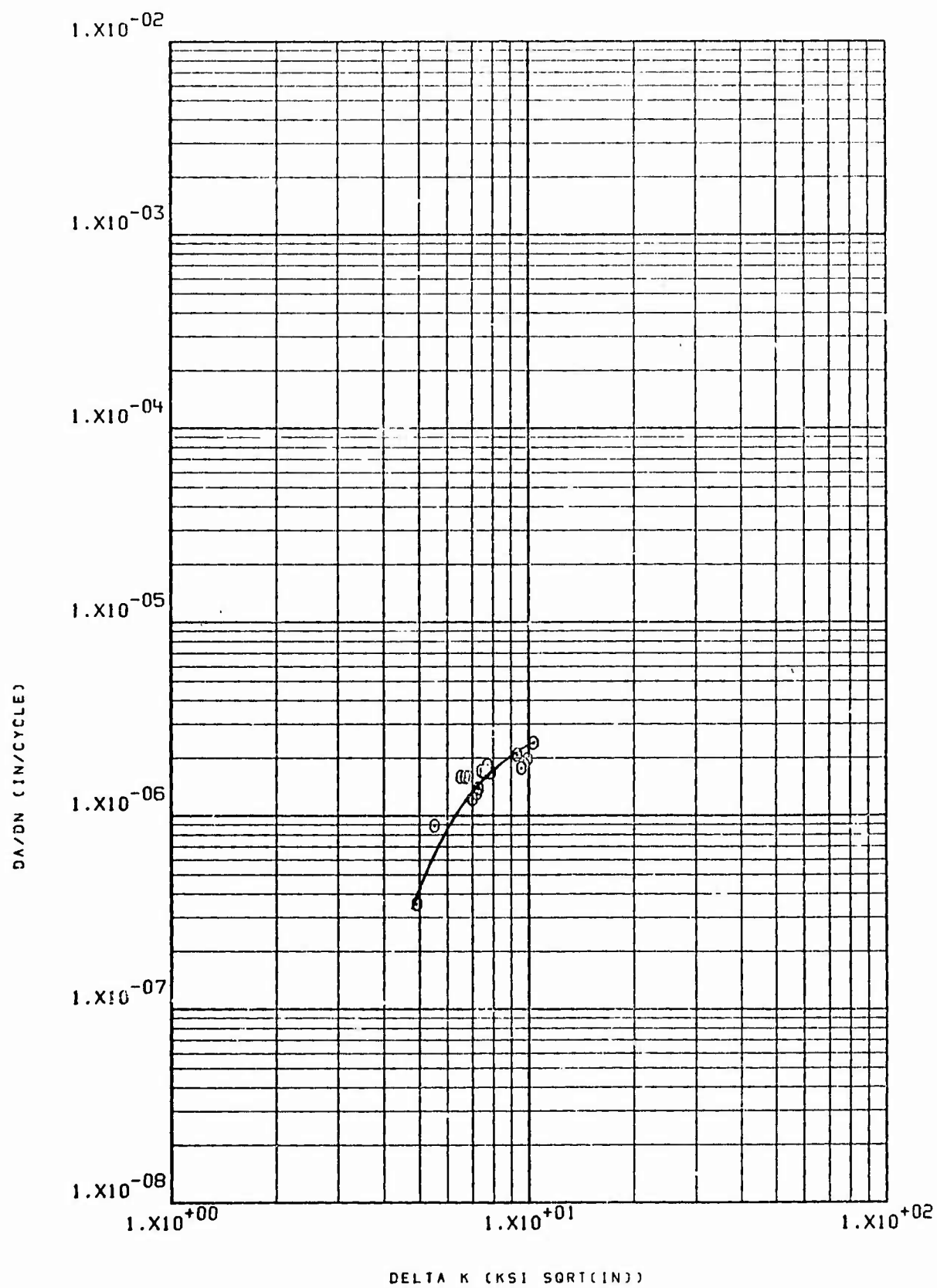
B-140



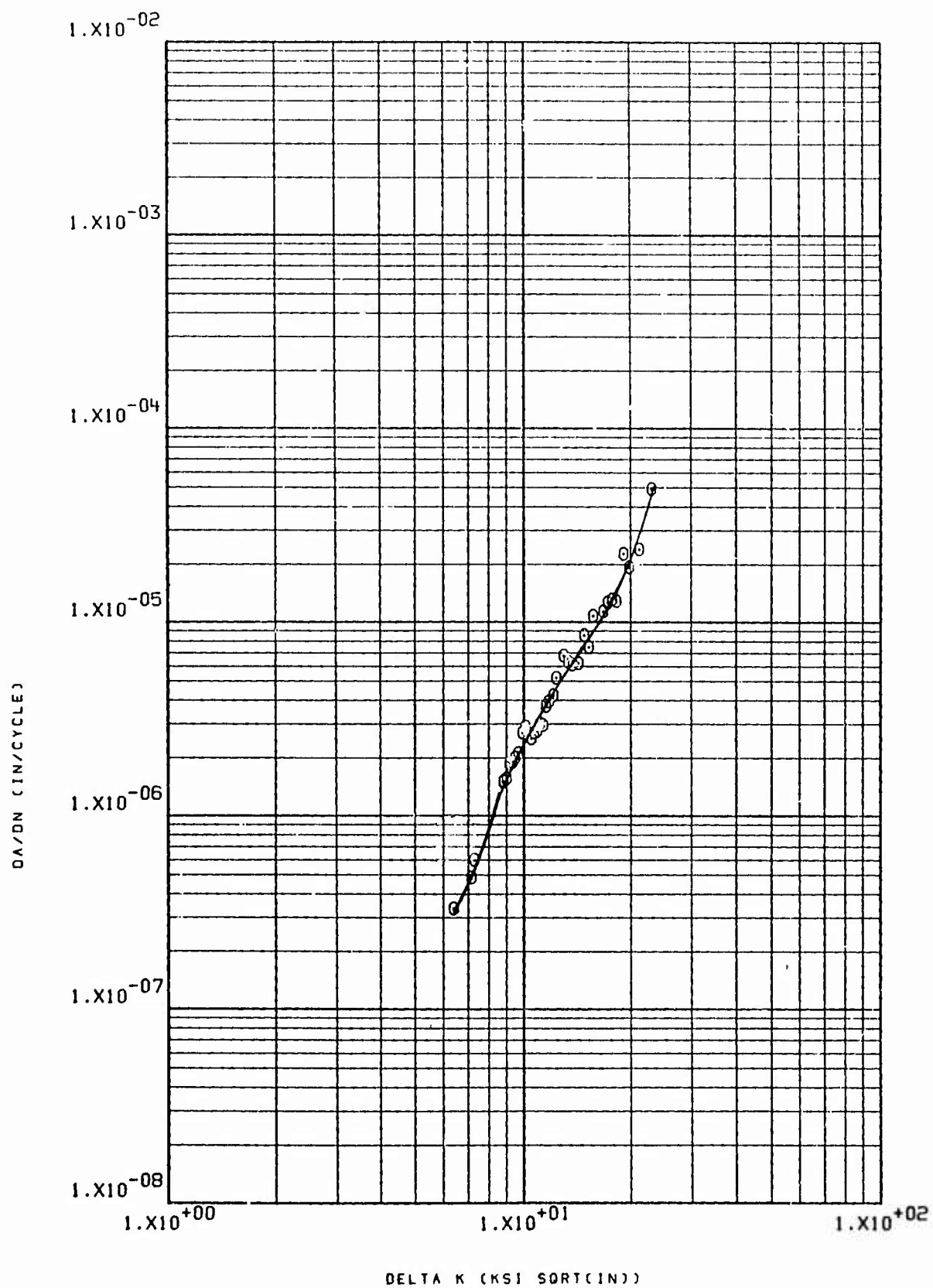
27 NRW 75-8 2024-T-852 HAND FORGING SUMP R.T. 60CPM R=.08

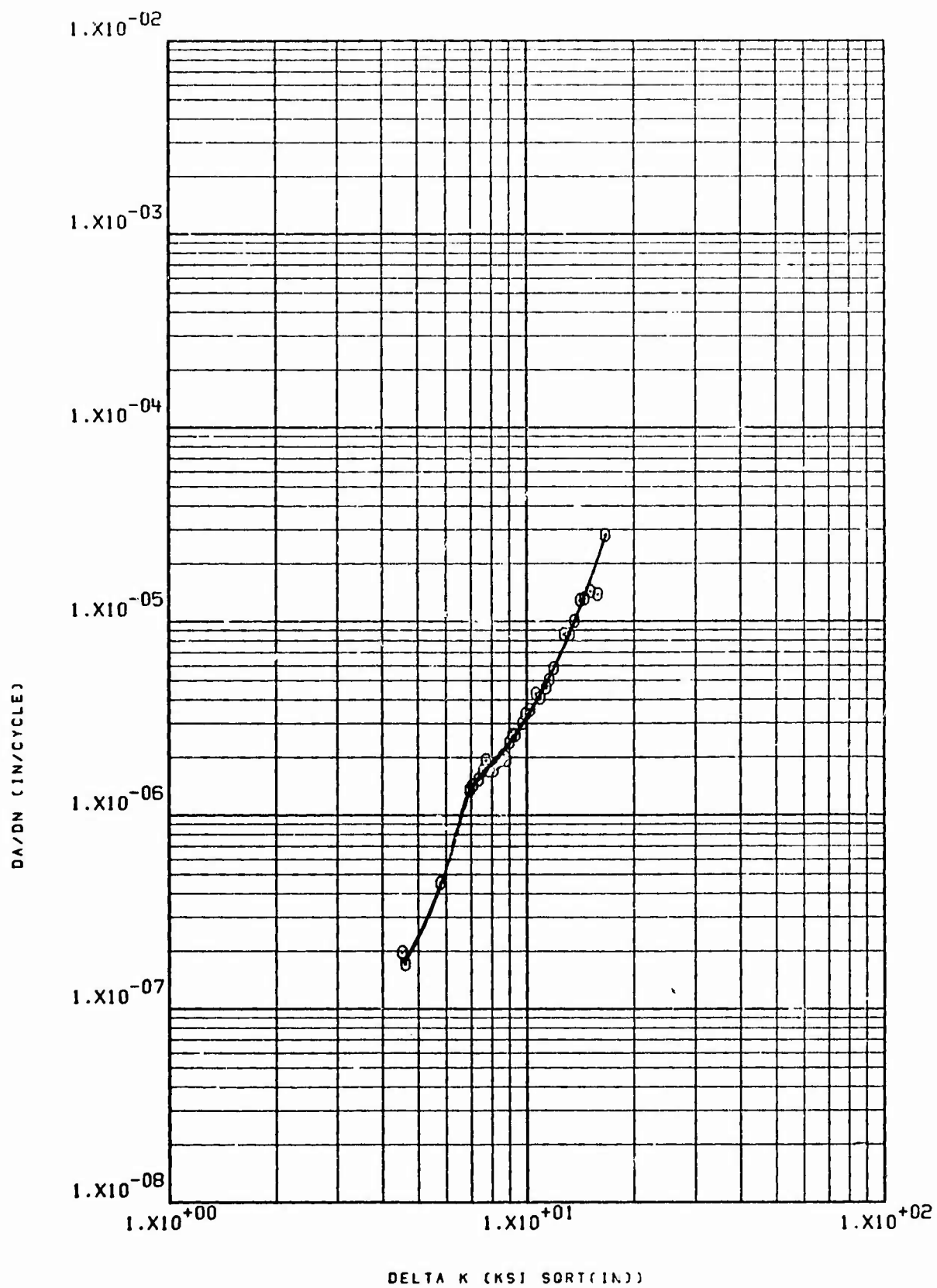


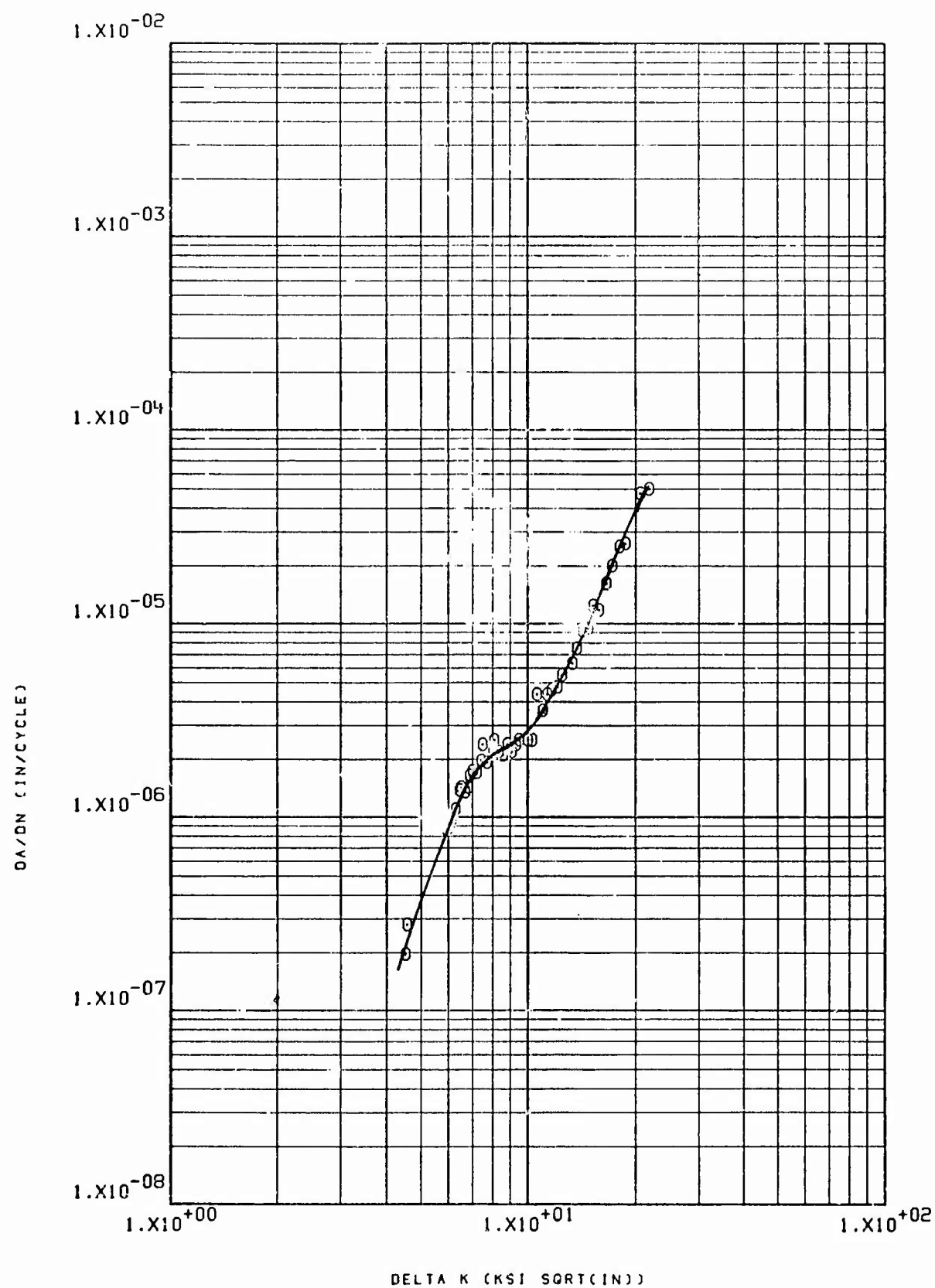
27 NRW 75-9 2024-T-852 HAND FORGING SUMP R.T. 60CPM R=.3



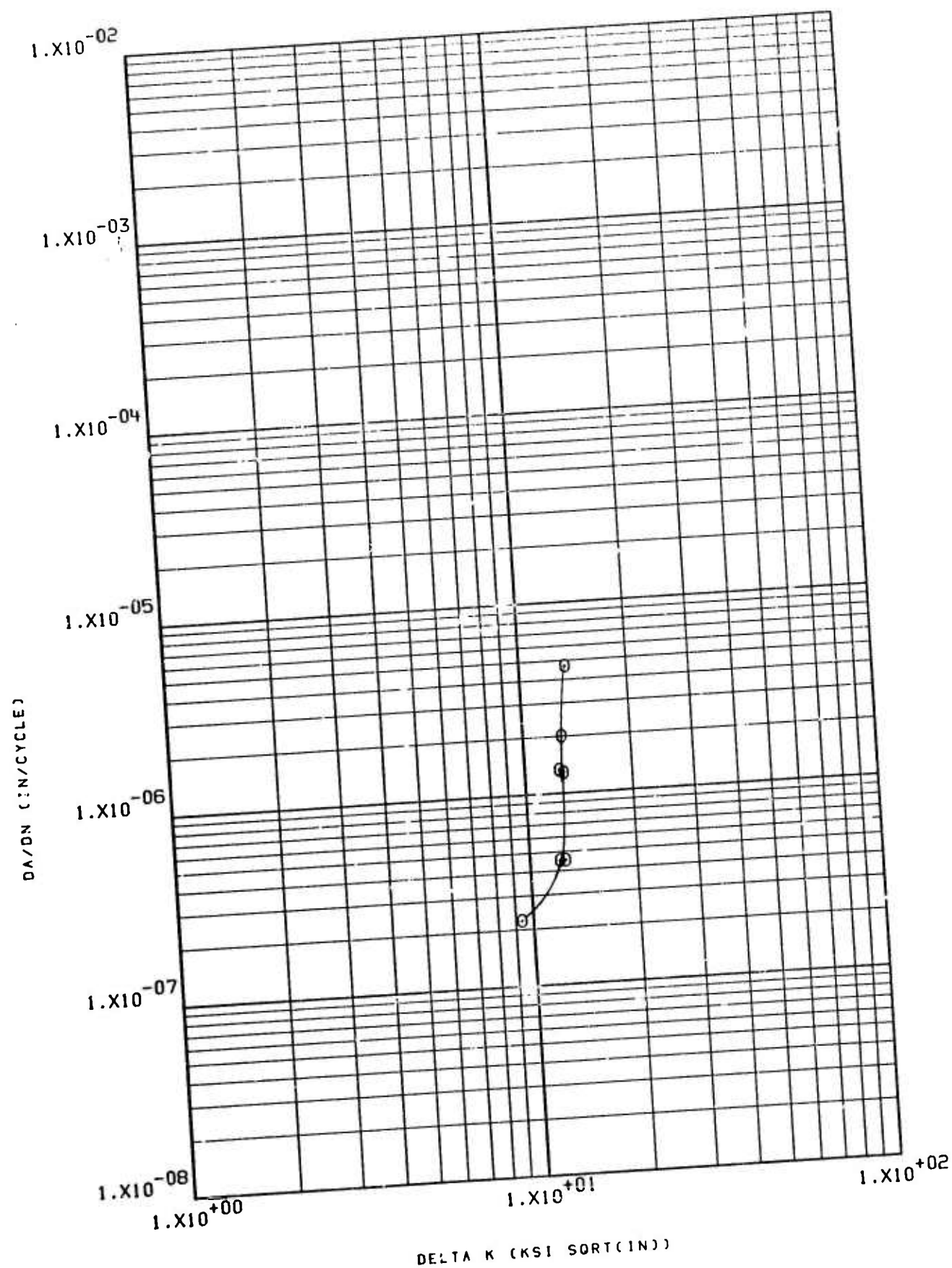
27 NRW 75-10 2024 T-852 HAND FORGING SUMP RT 60CPH R=.5

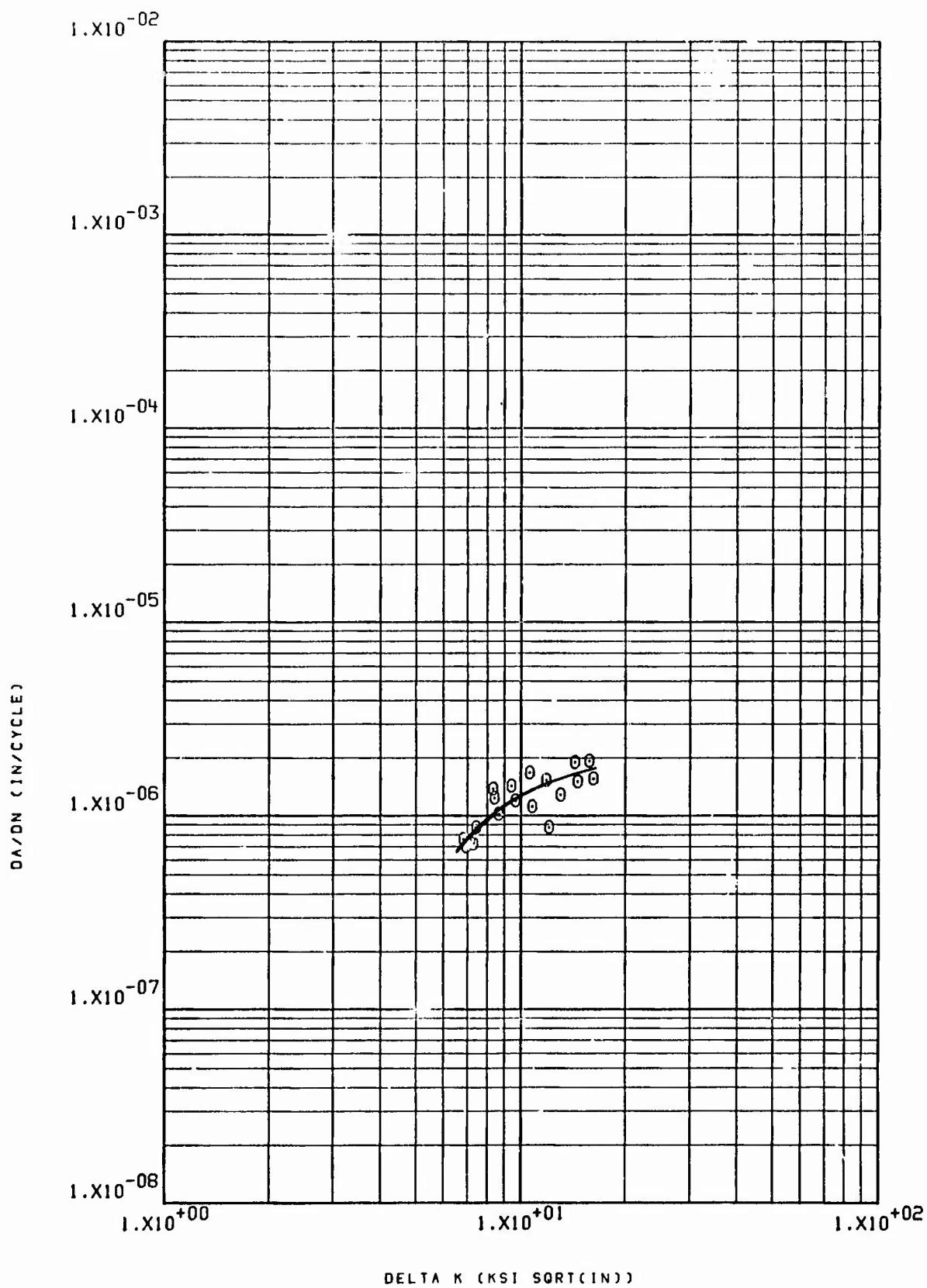


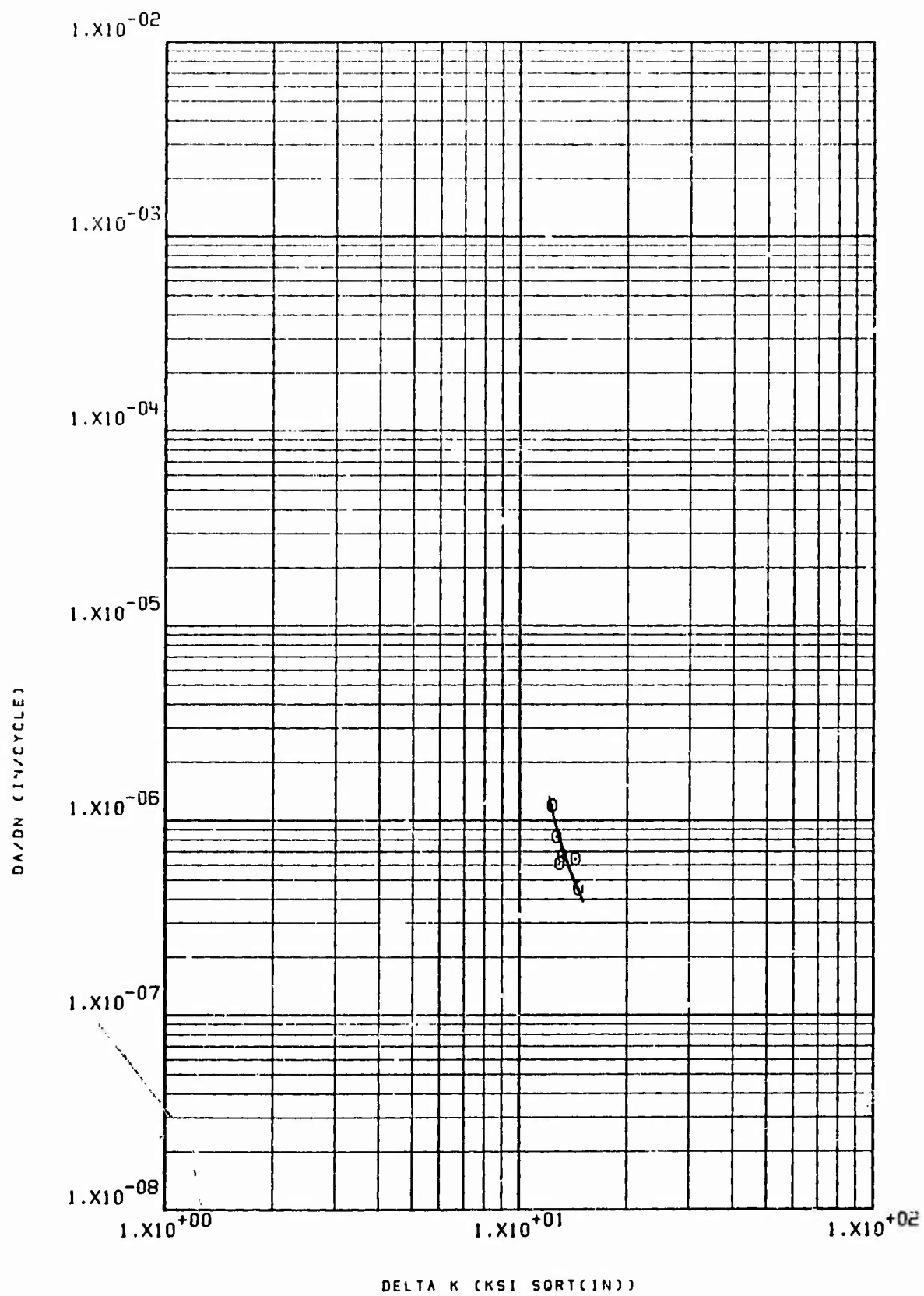


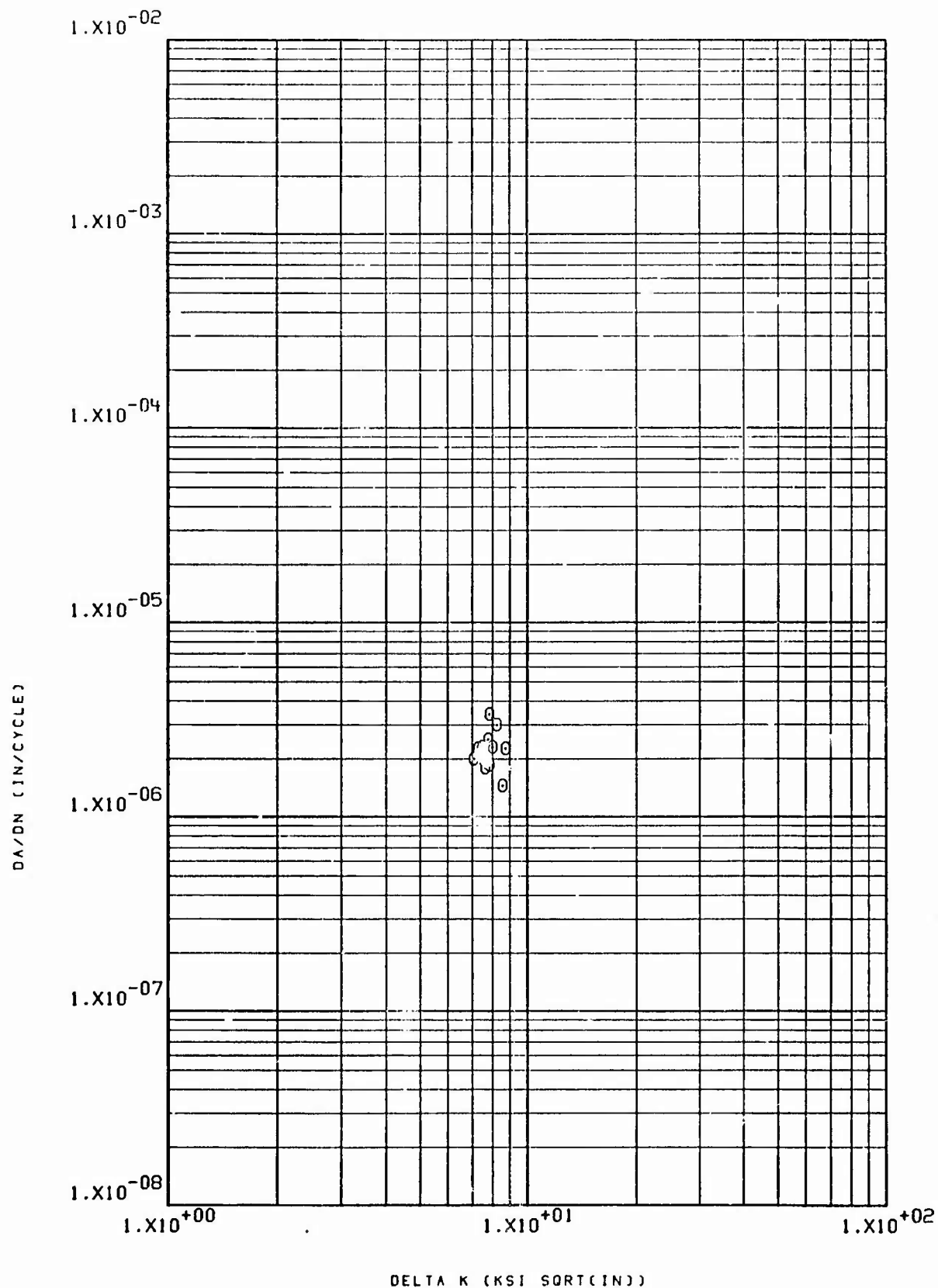


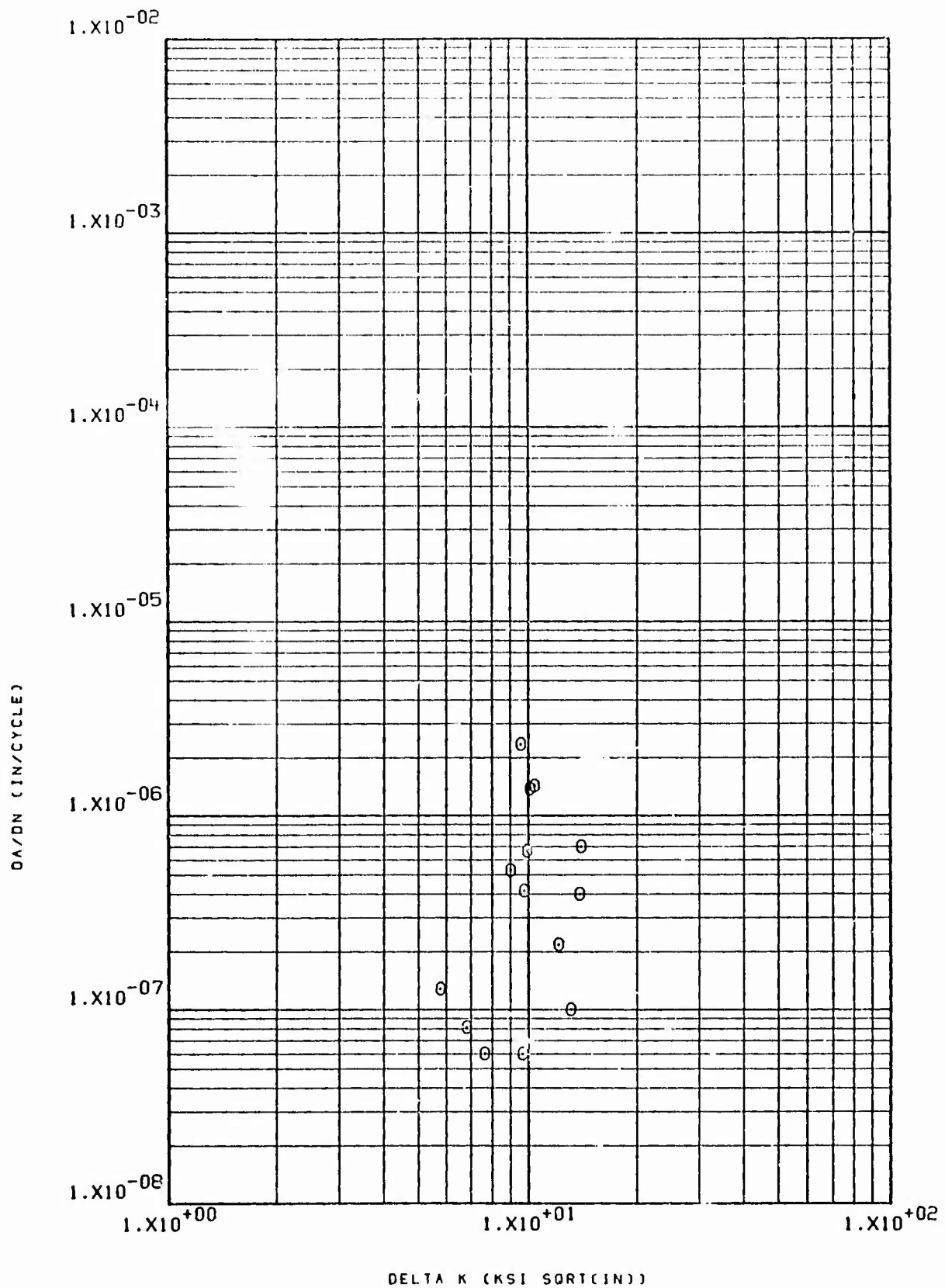
27 NRW 75-13 2024-T852 HAND FORGING LHA R.T. 360CPM R=.08





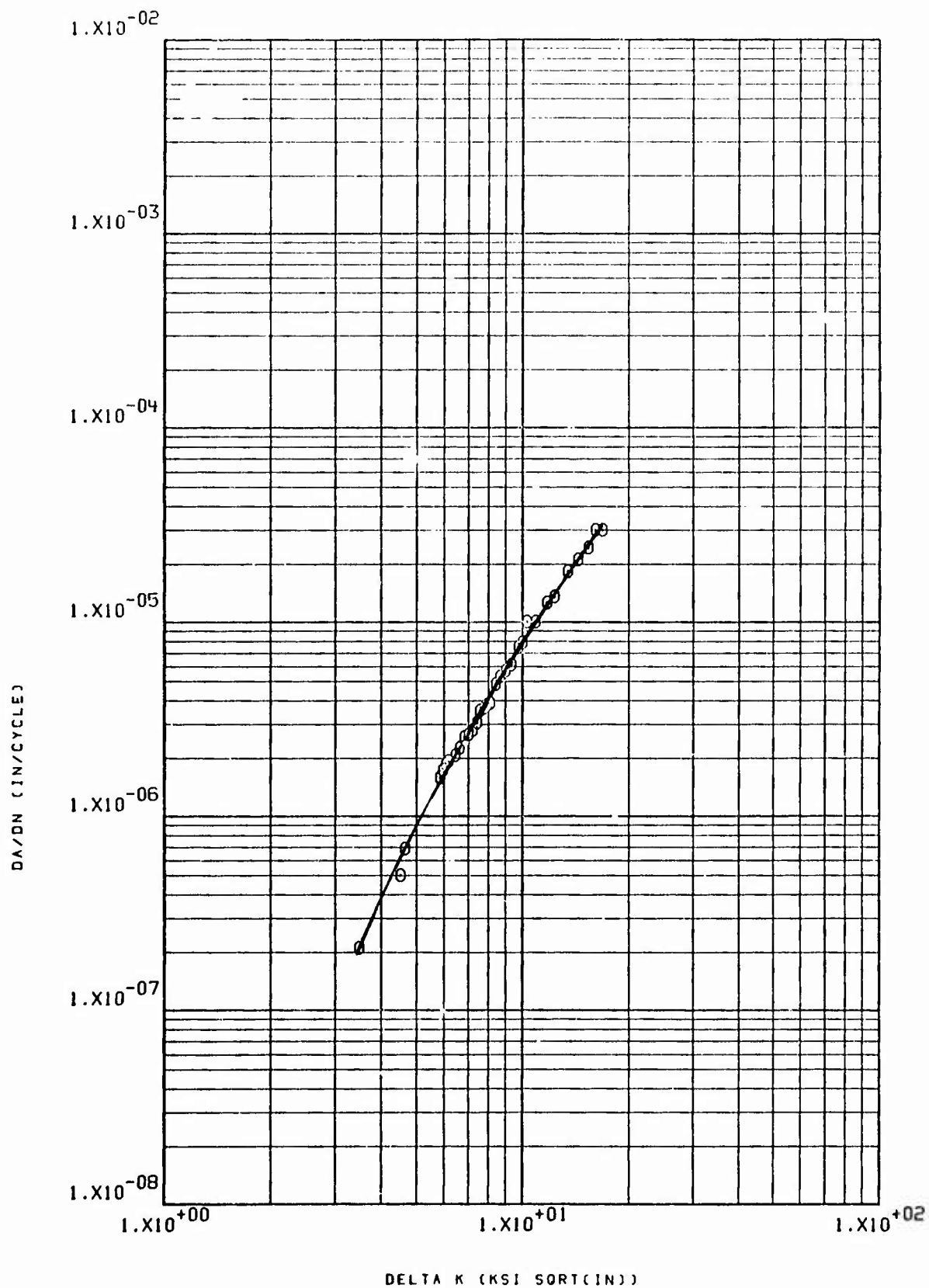






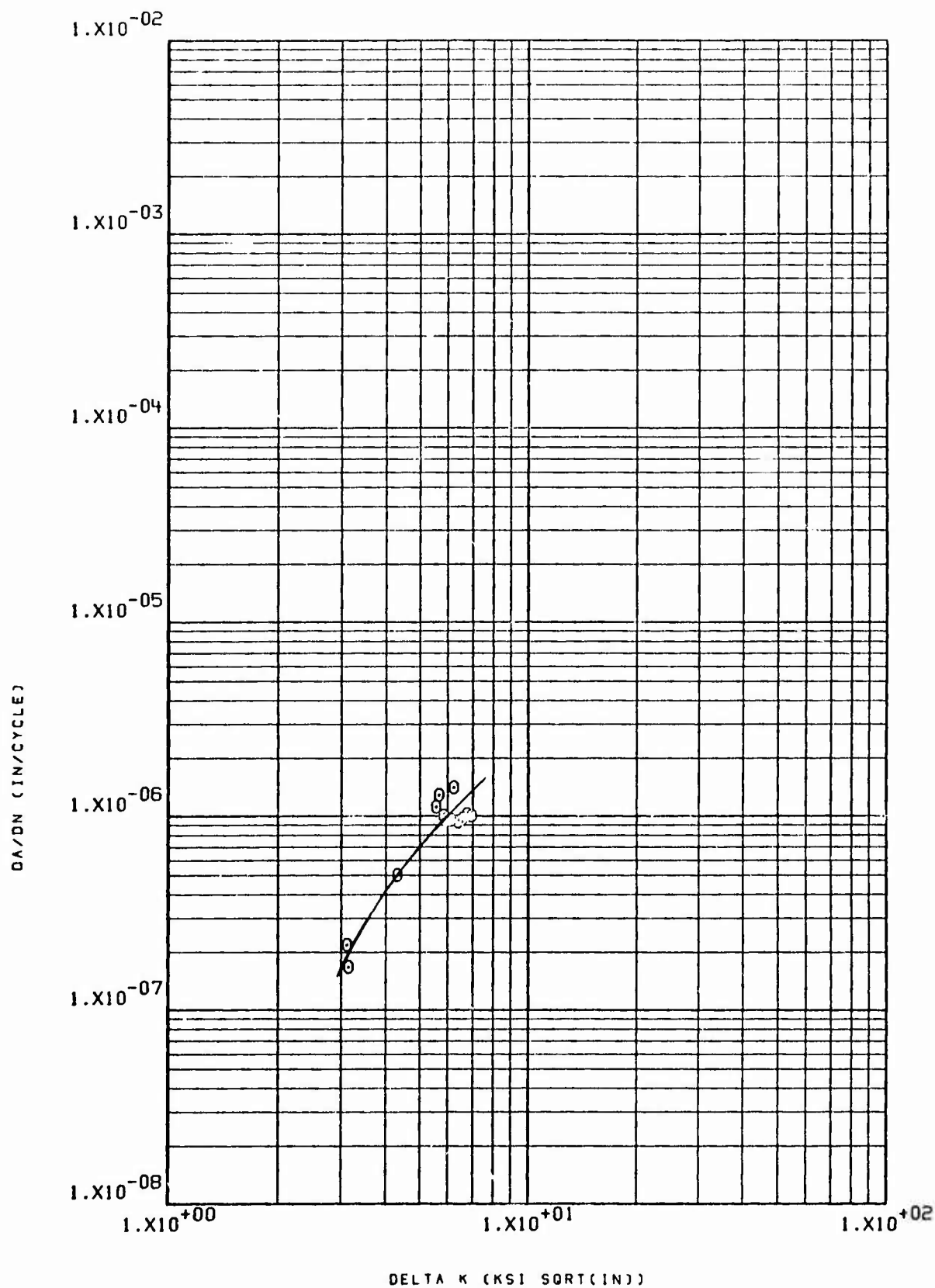
27 NRW 75-51 2024-1852 HAND FORGING ALUM SUMP 150F R=.08 60CPM

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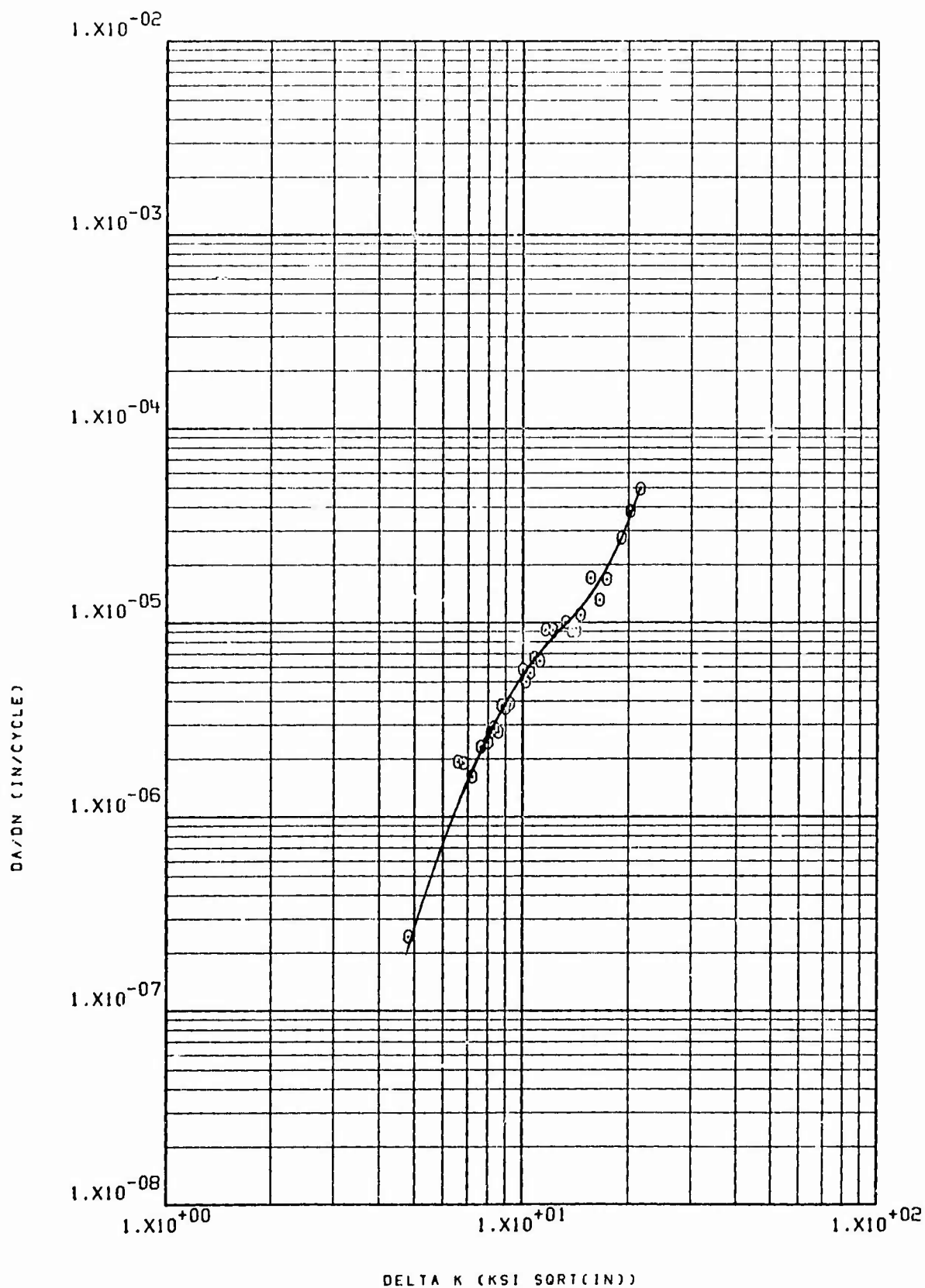
27 NRW 75-52 2024-T852 FORG SHOP CLN SOLV RT R=.08 60CPM

B-152

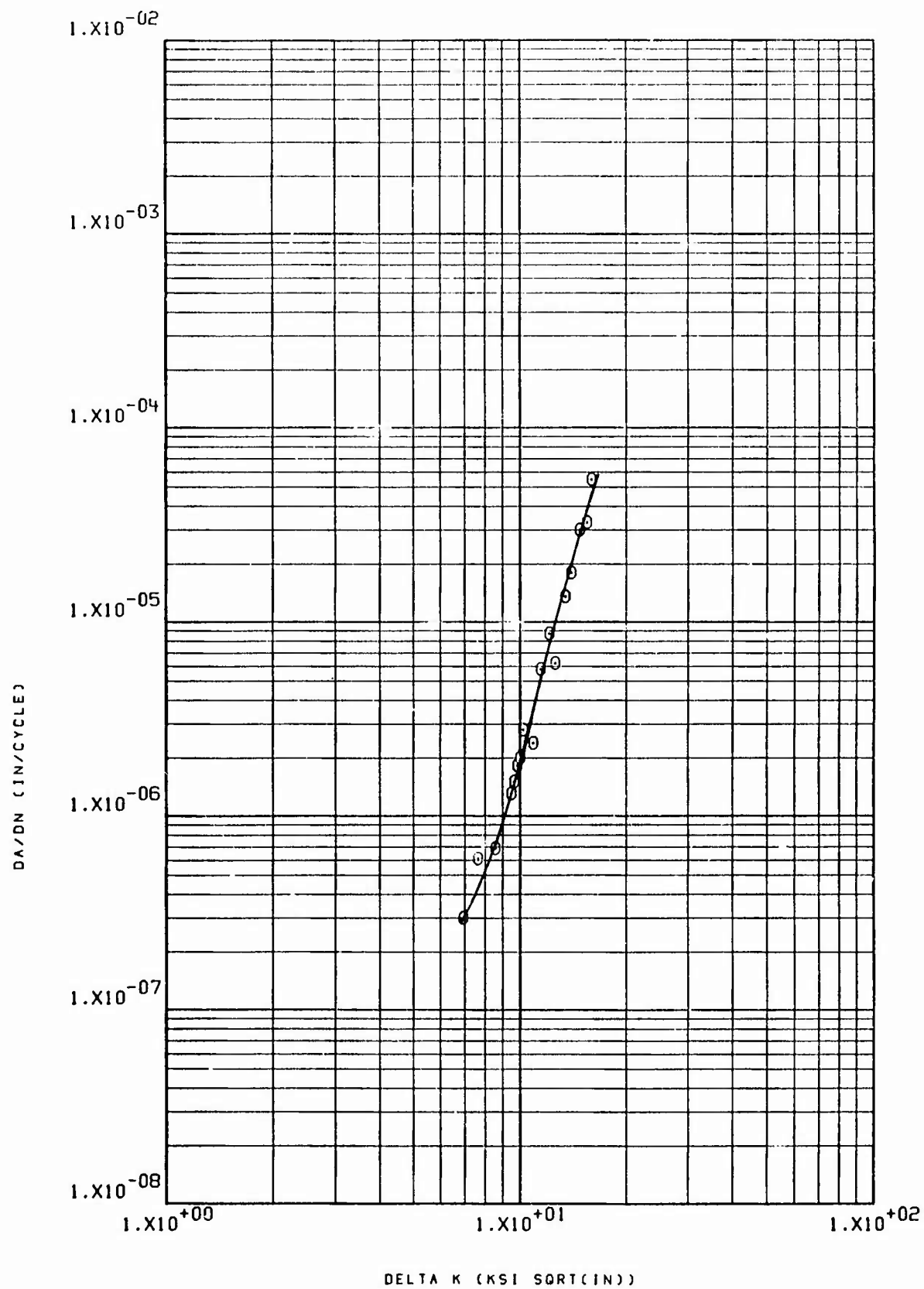


27 NRW 75-53 1852 2024 ALUM HAND FORGING LHA RT R=.7 360CPM

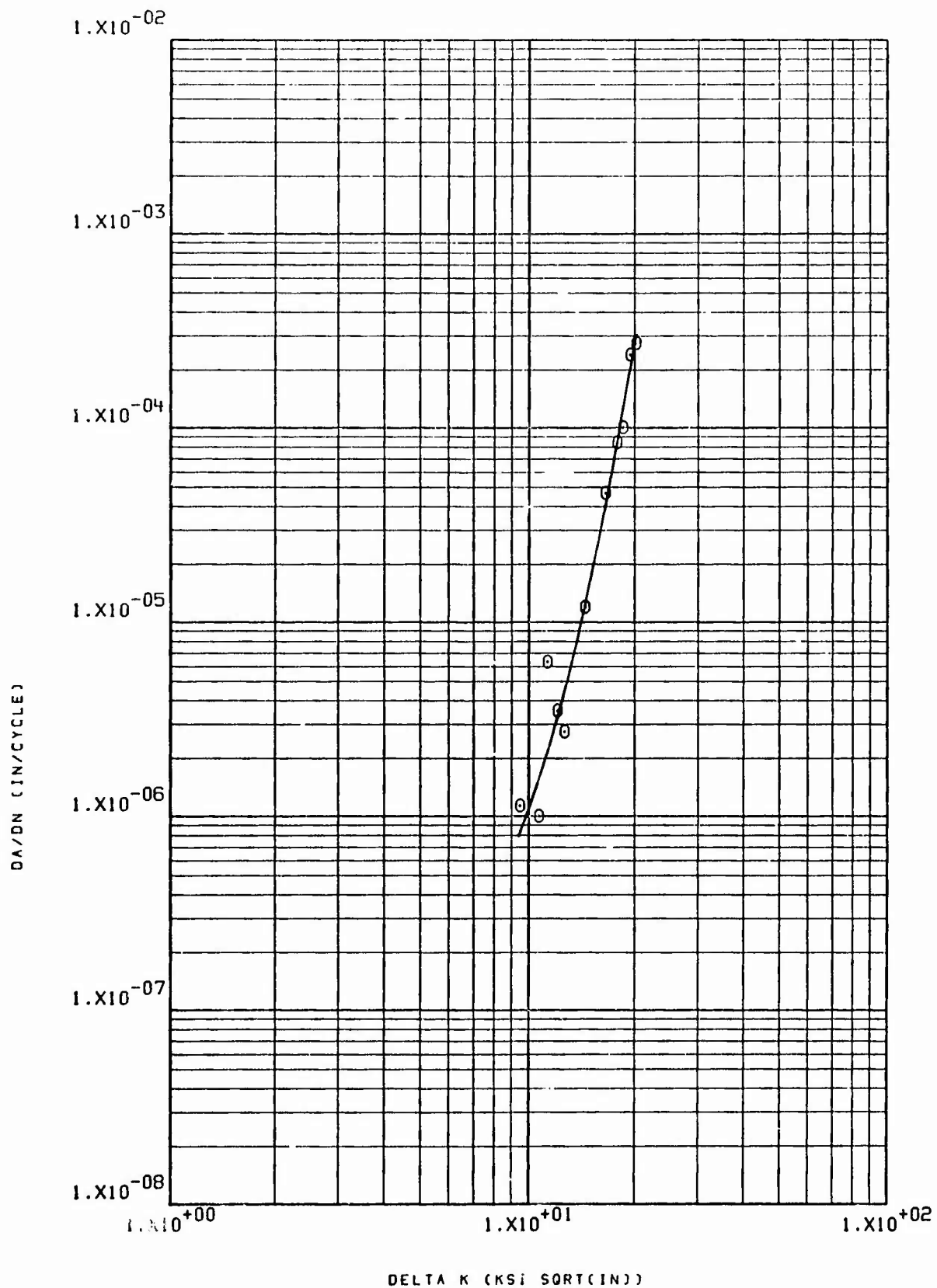
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27 NRW 75-54 2024-1852 FORGING LHA 265F 360CPM R=.00

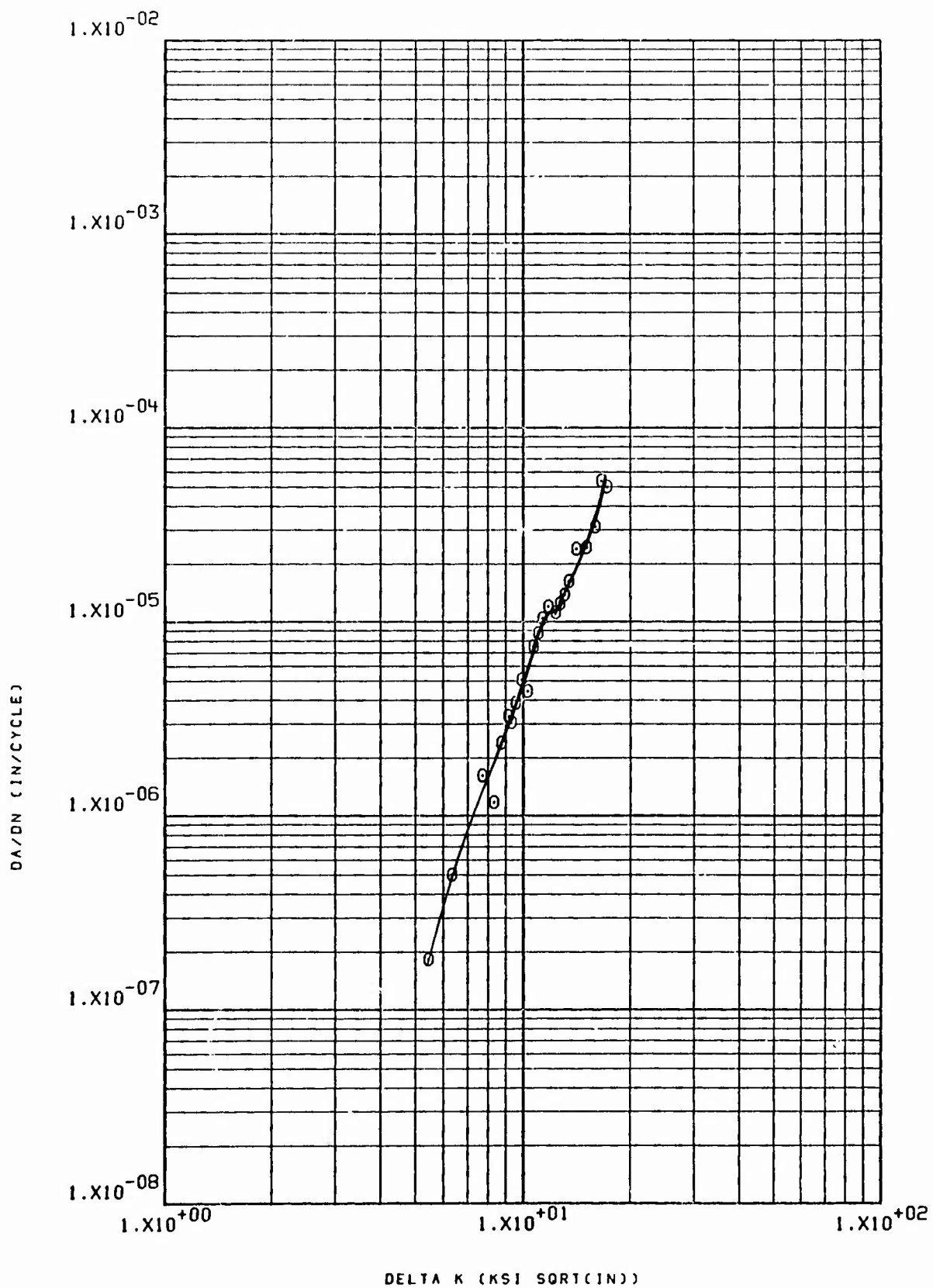


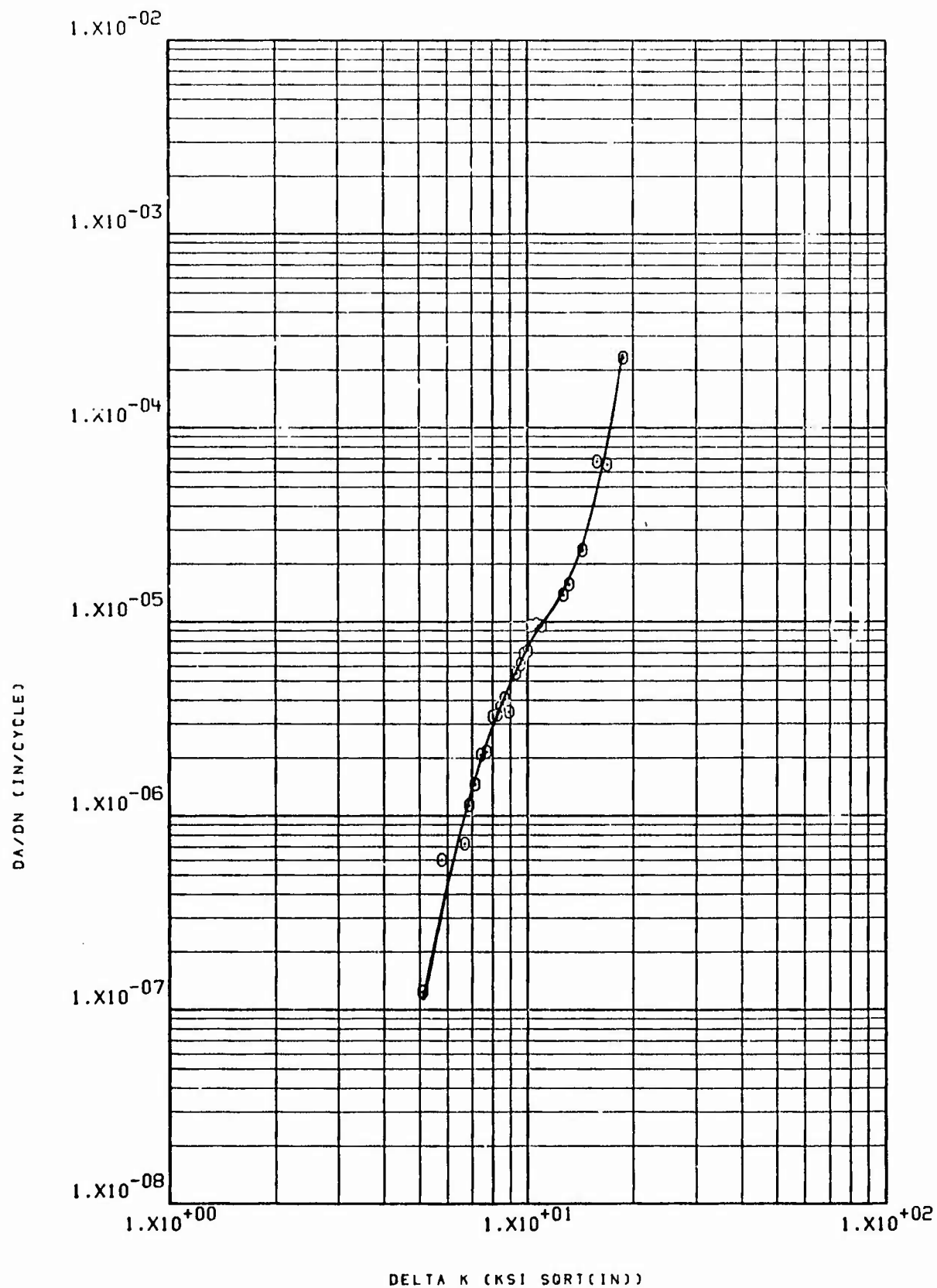
27 NWR 75-55 2024-1852 HAND FORGING ALUM SUMP RT R=.08 60CPM



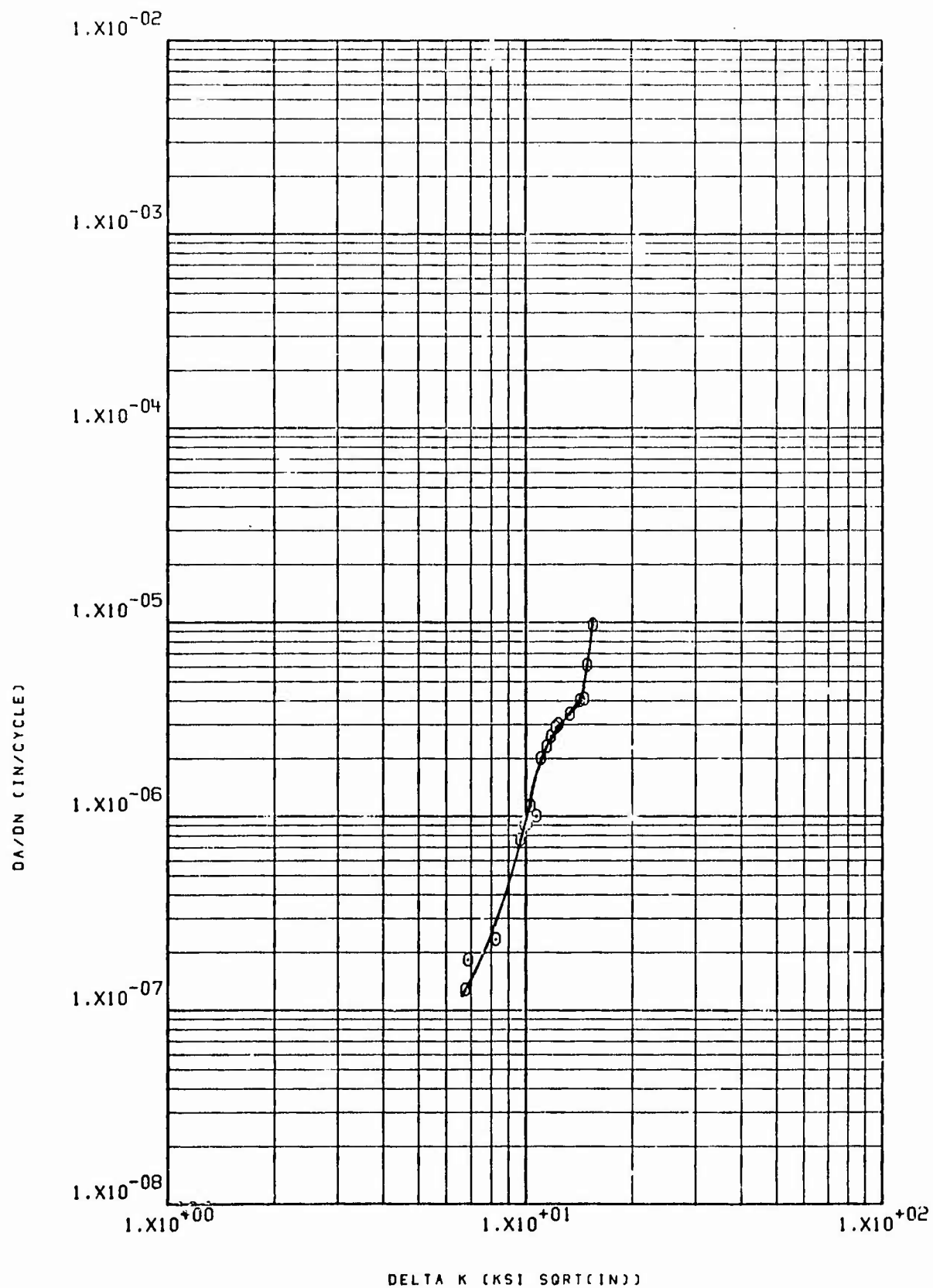
27 NWR 75-56 2024 T852 ALUN HD FORGE SUMP RT R=.08 6CPH

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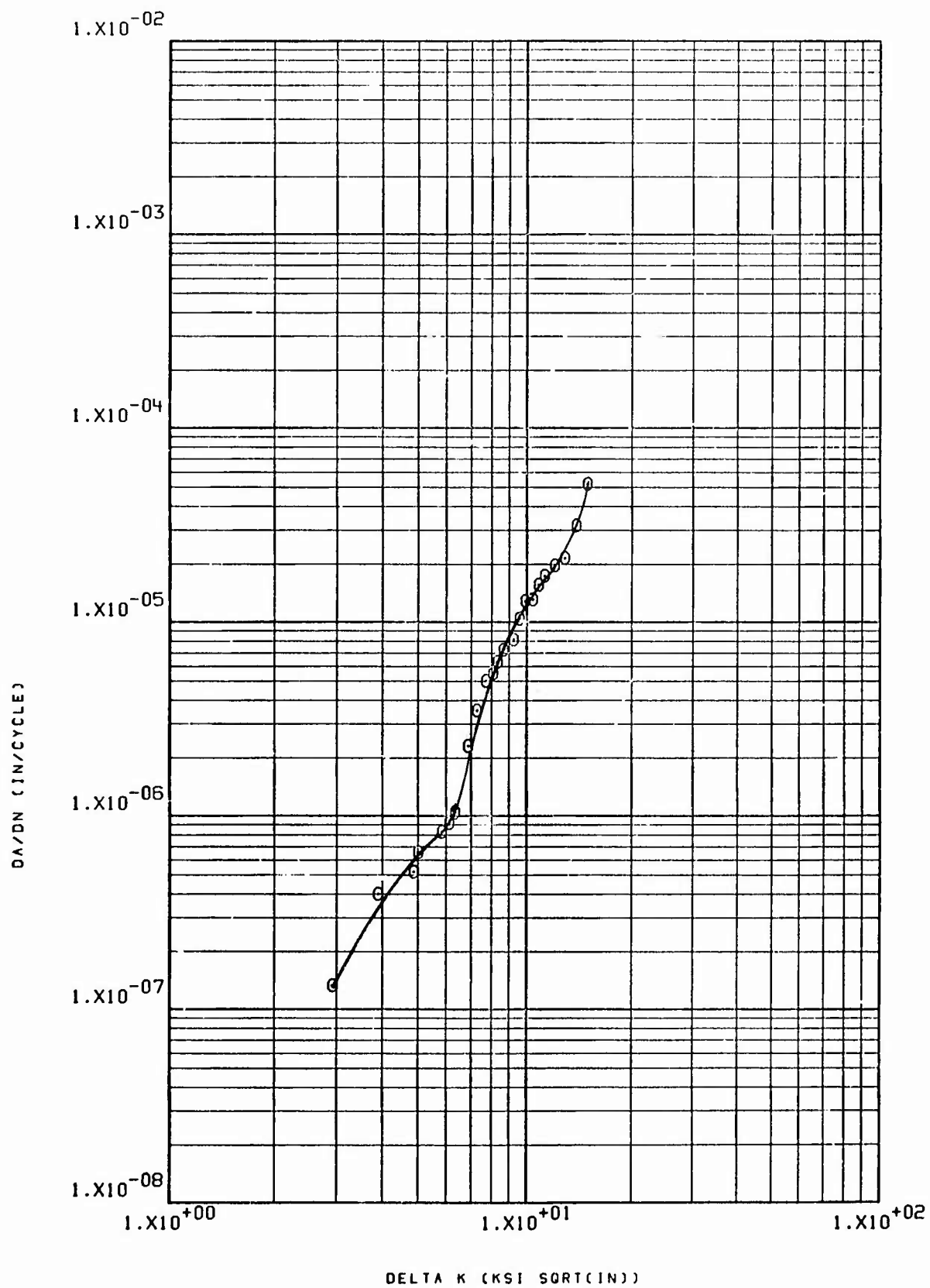




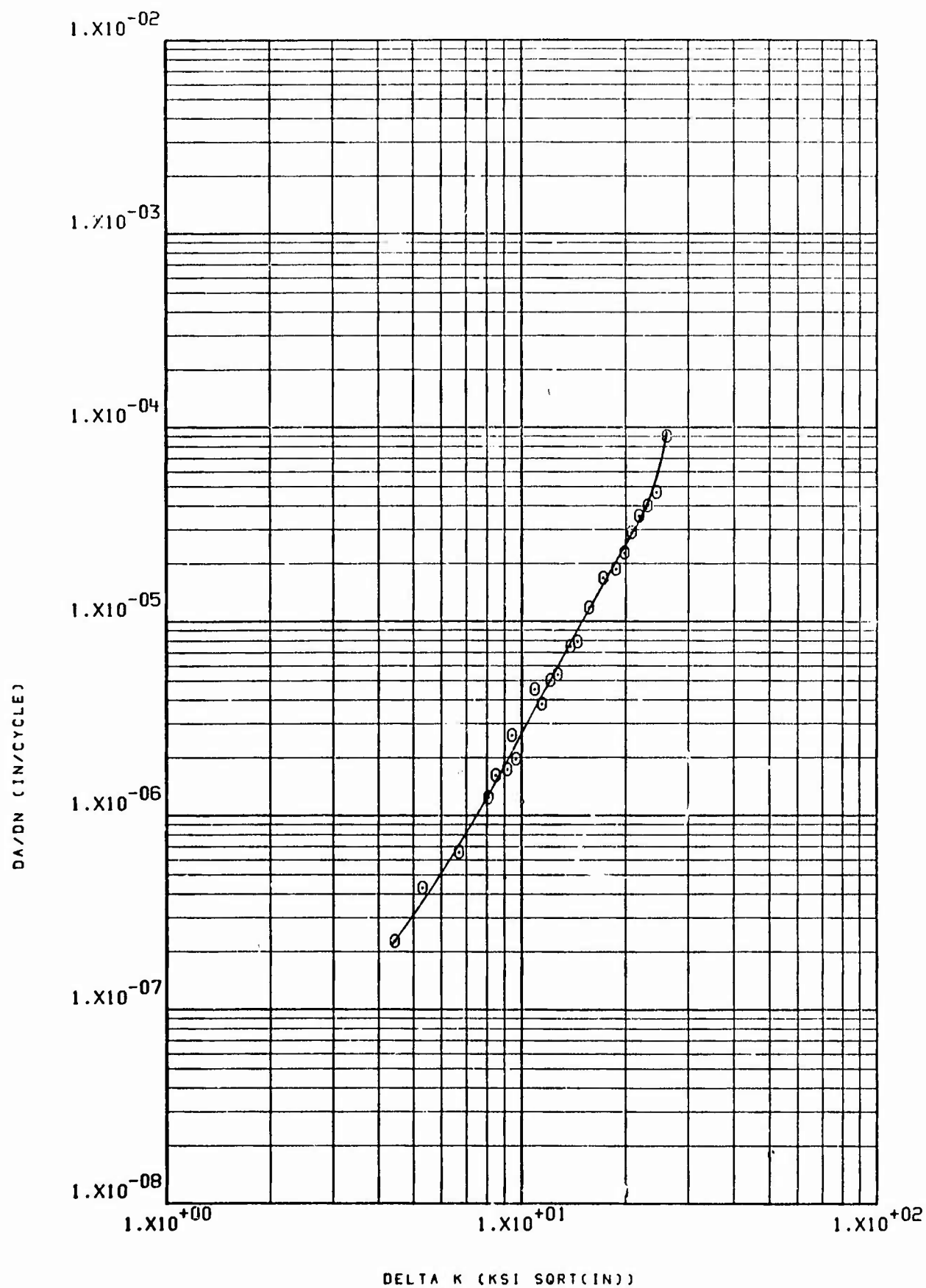
27 NWR 75-58 2024-T852 HAND FORGING ALUM LHA 265F R=.08 360CPH

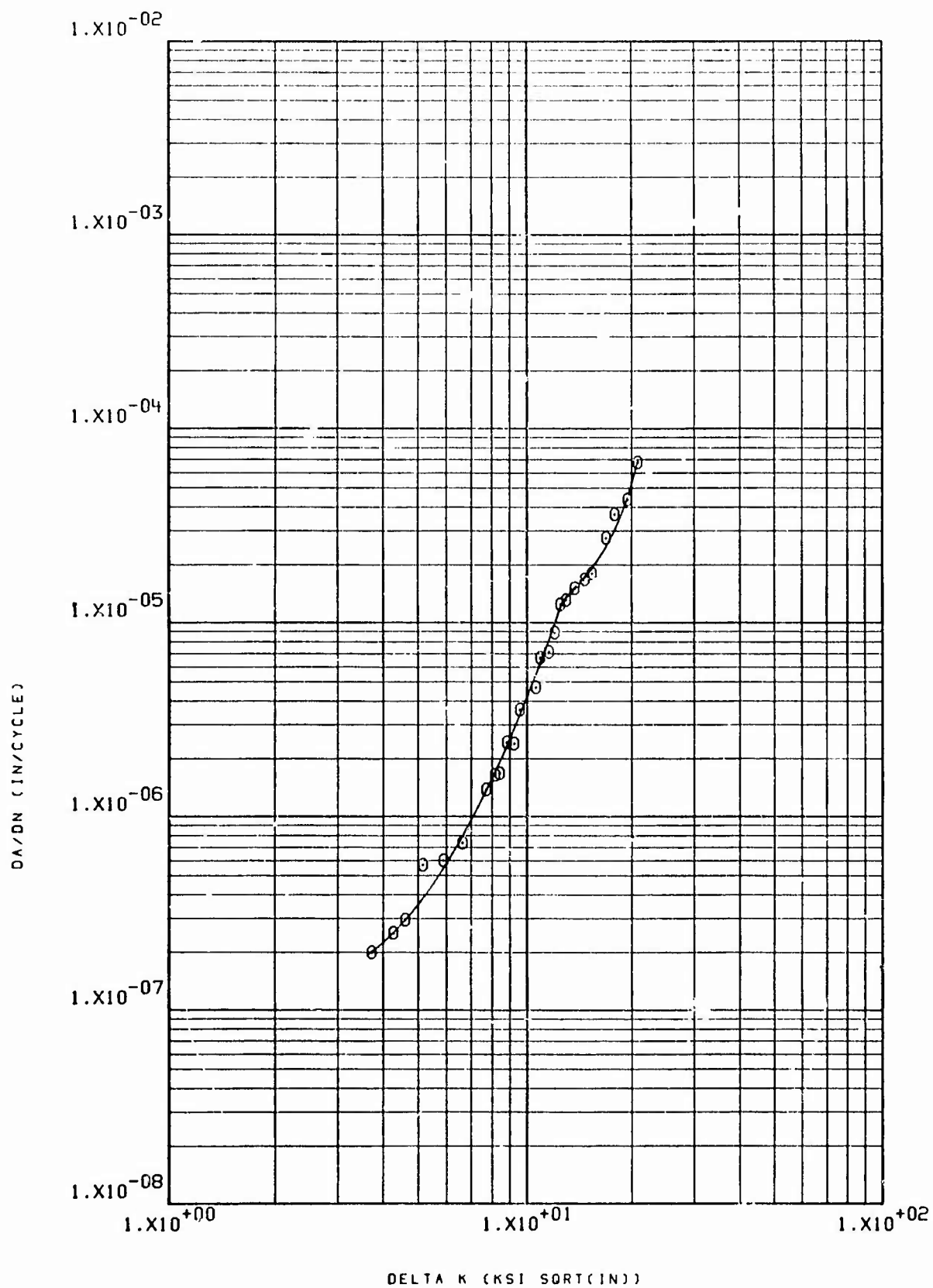


27 NWR 75-59 2024-T852 FORGING LHA RT R=.08 360CPM

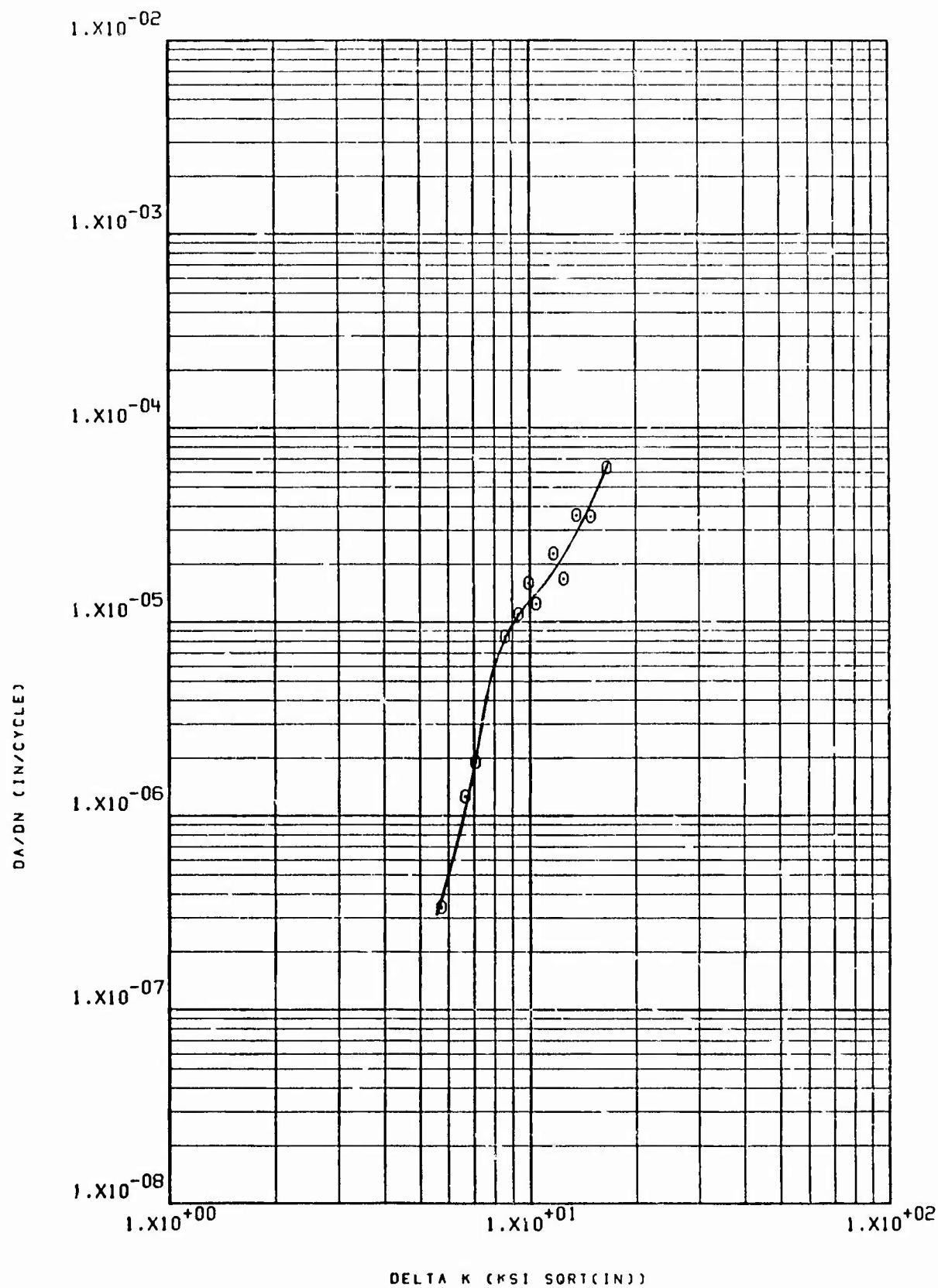


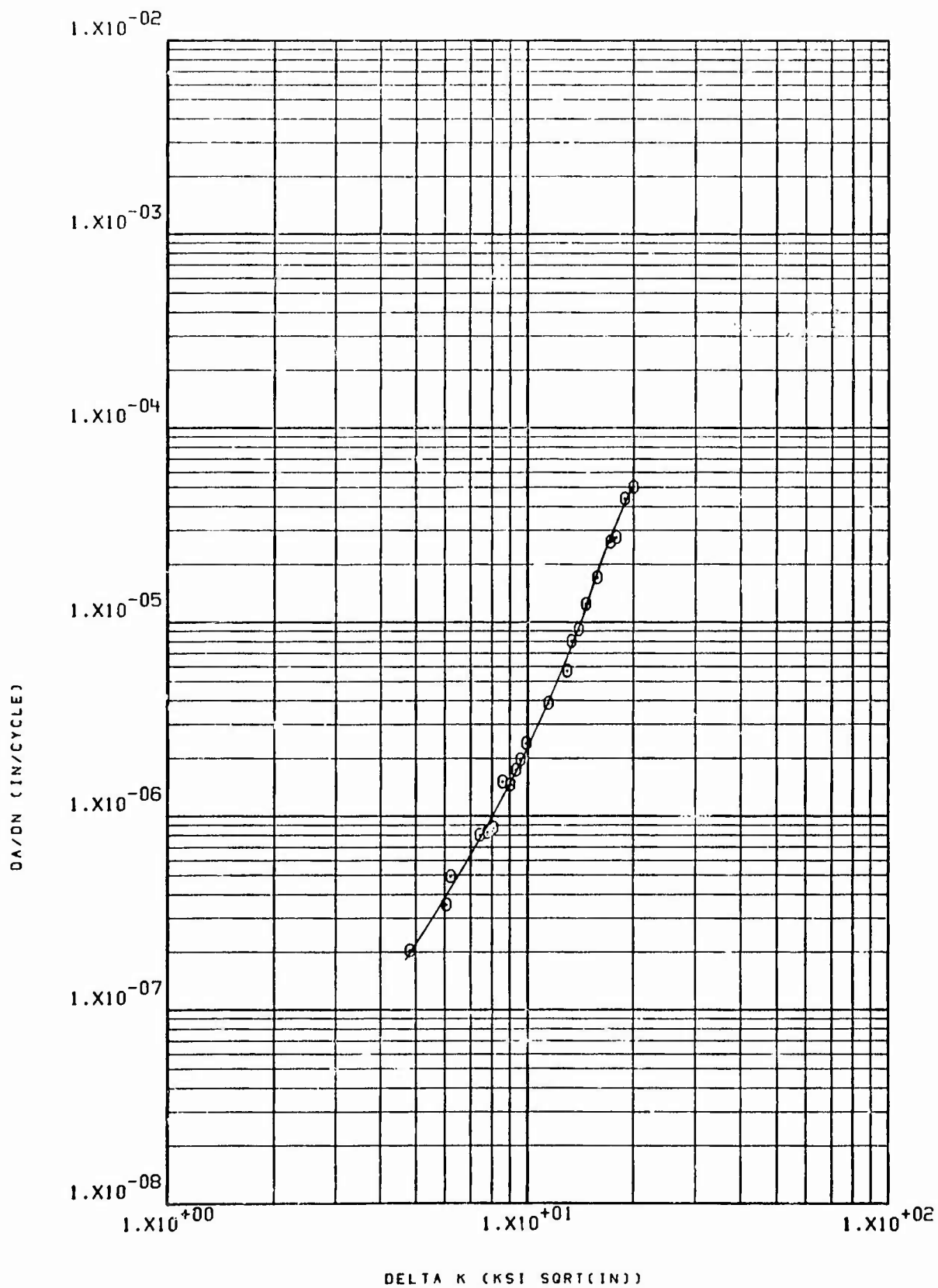
28 NRW 80-22 7050-T-73651 ALUM LHA RT R=.5 360CPH

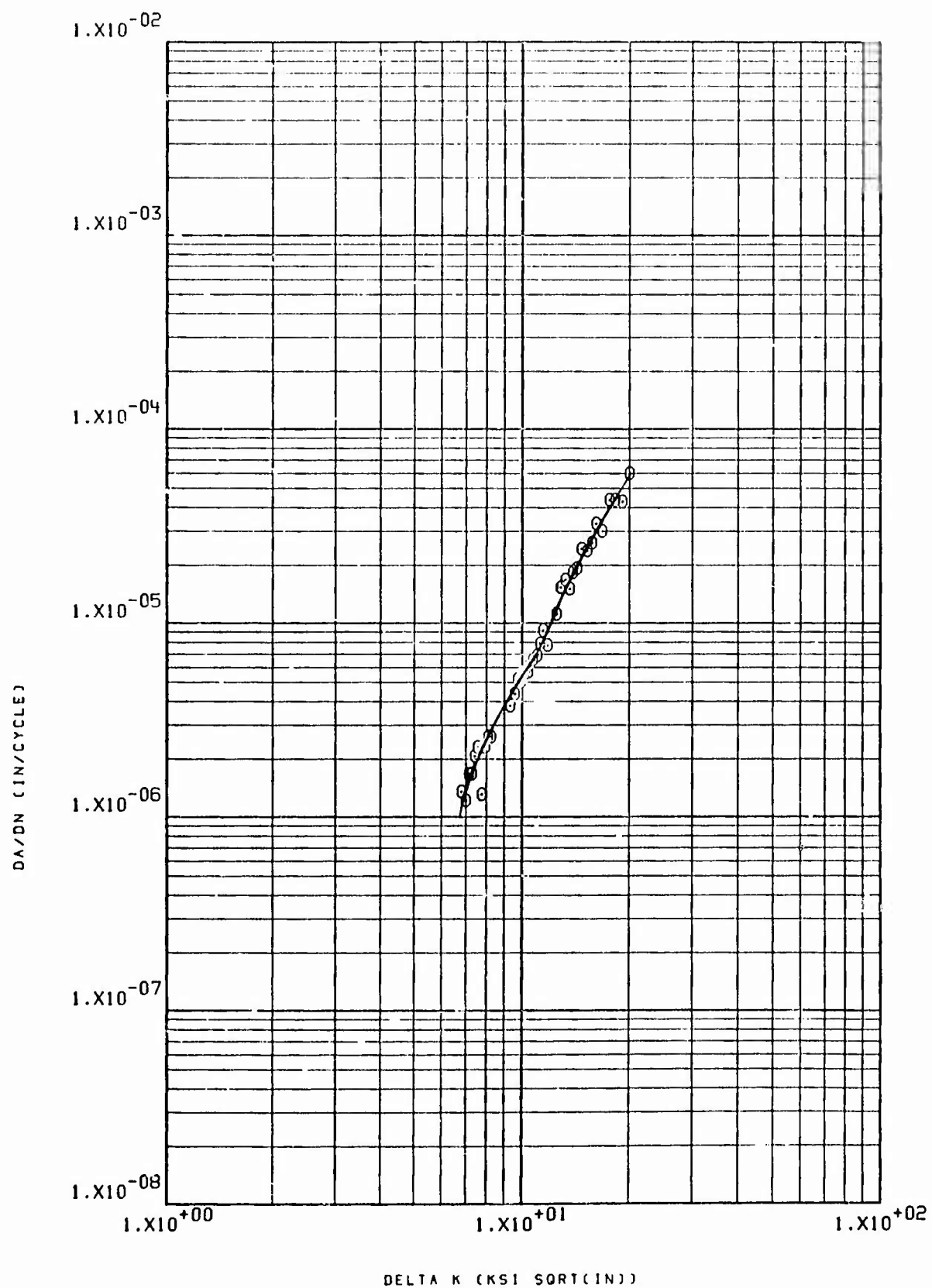


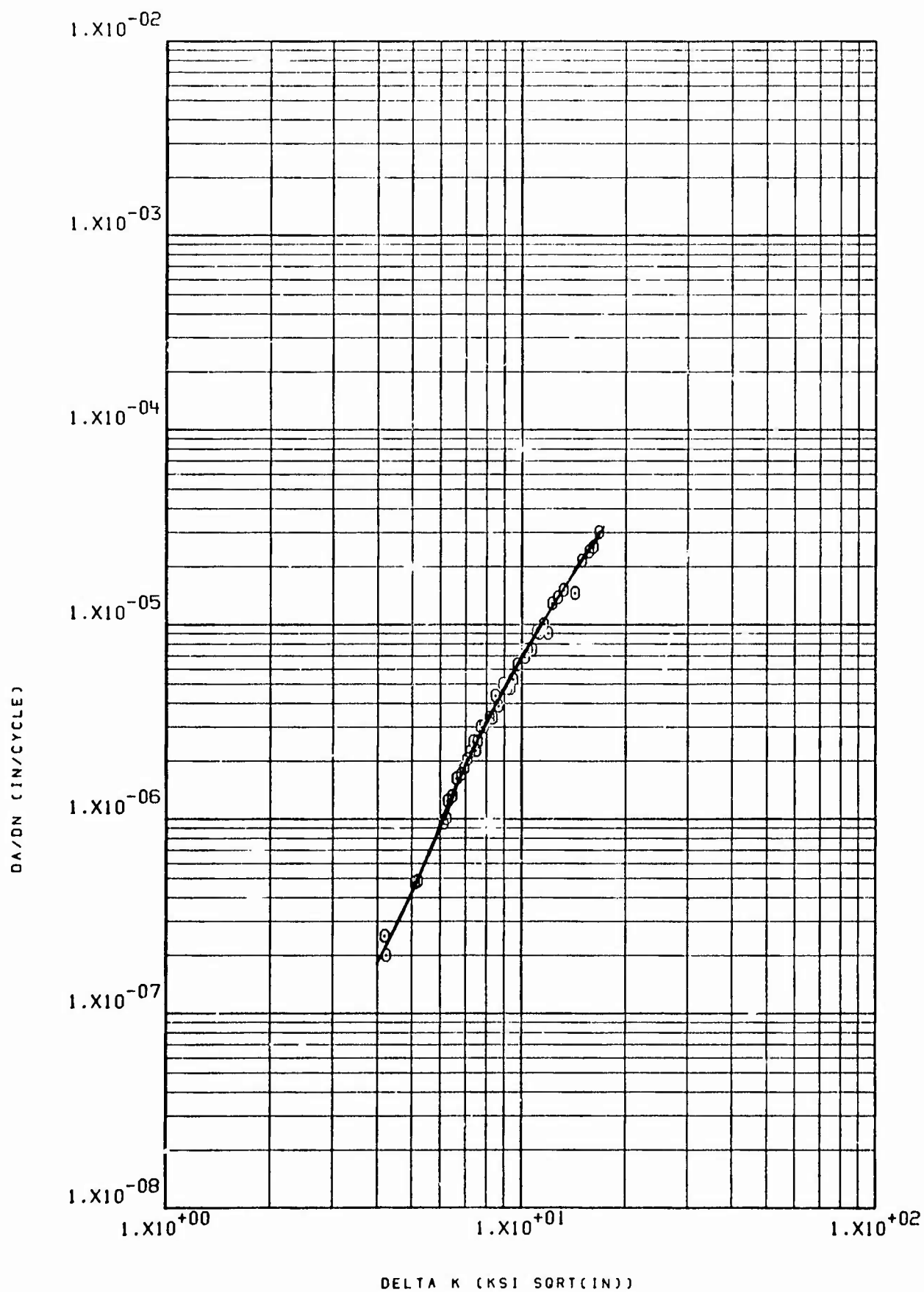


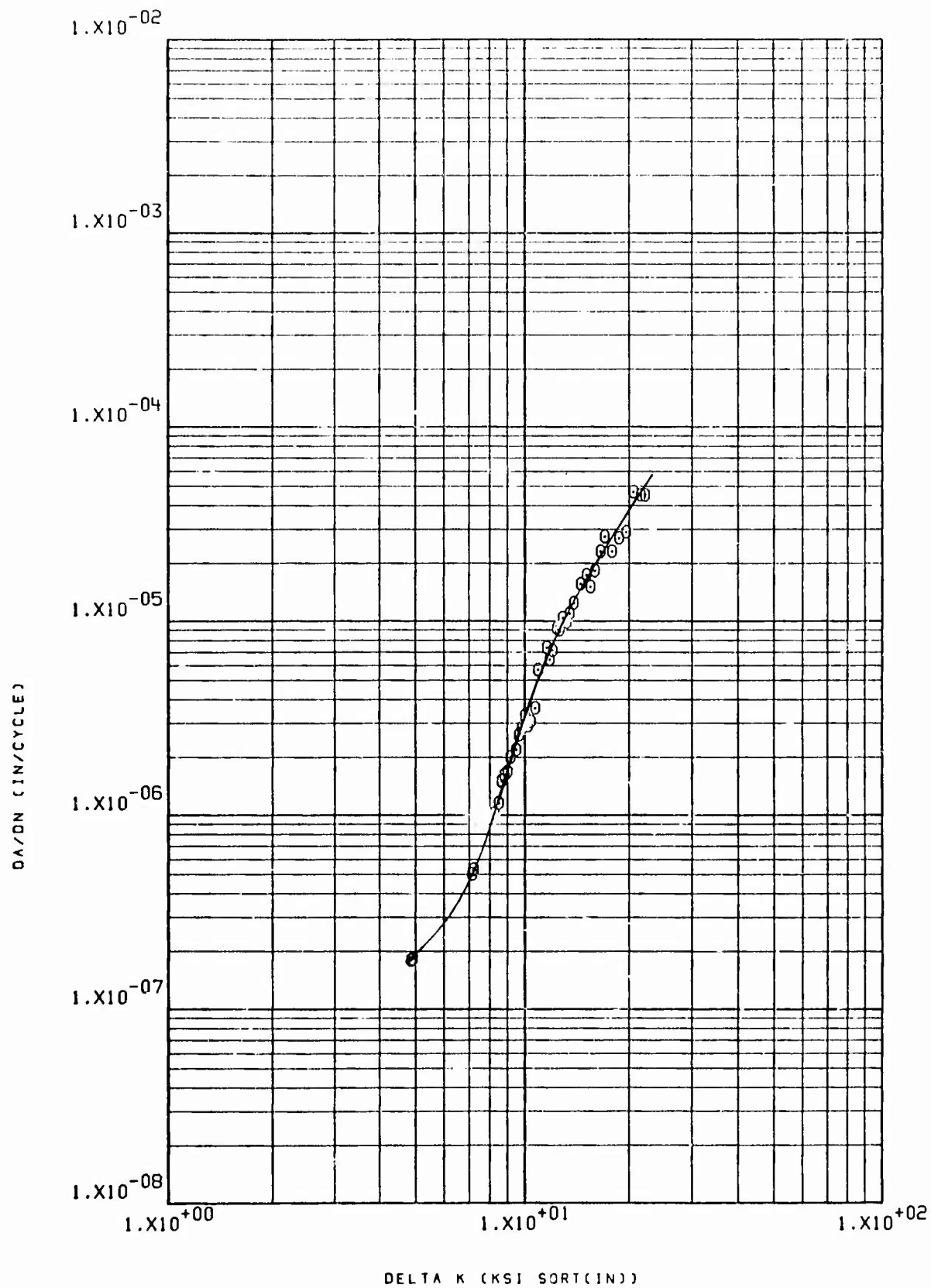
28 NRW 80-24 7050-T73651 ALUM LHA RT R=.3 360CPH



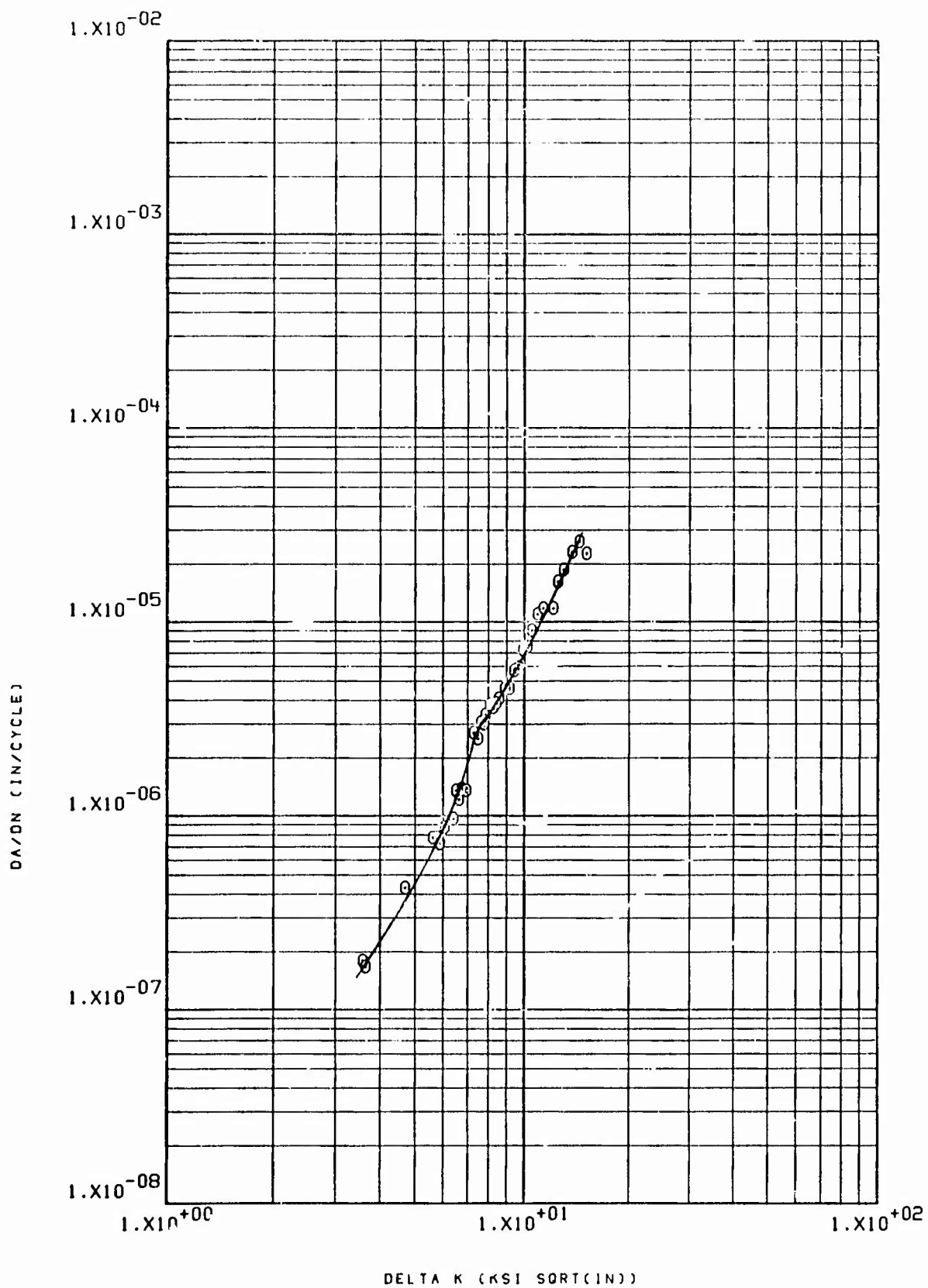


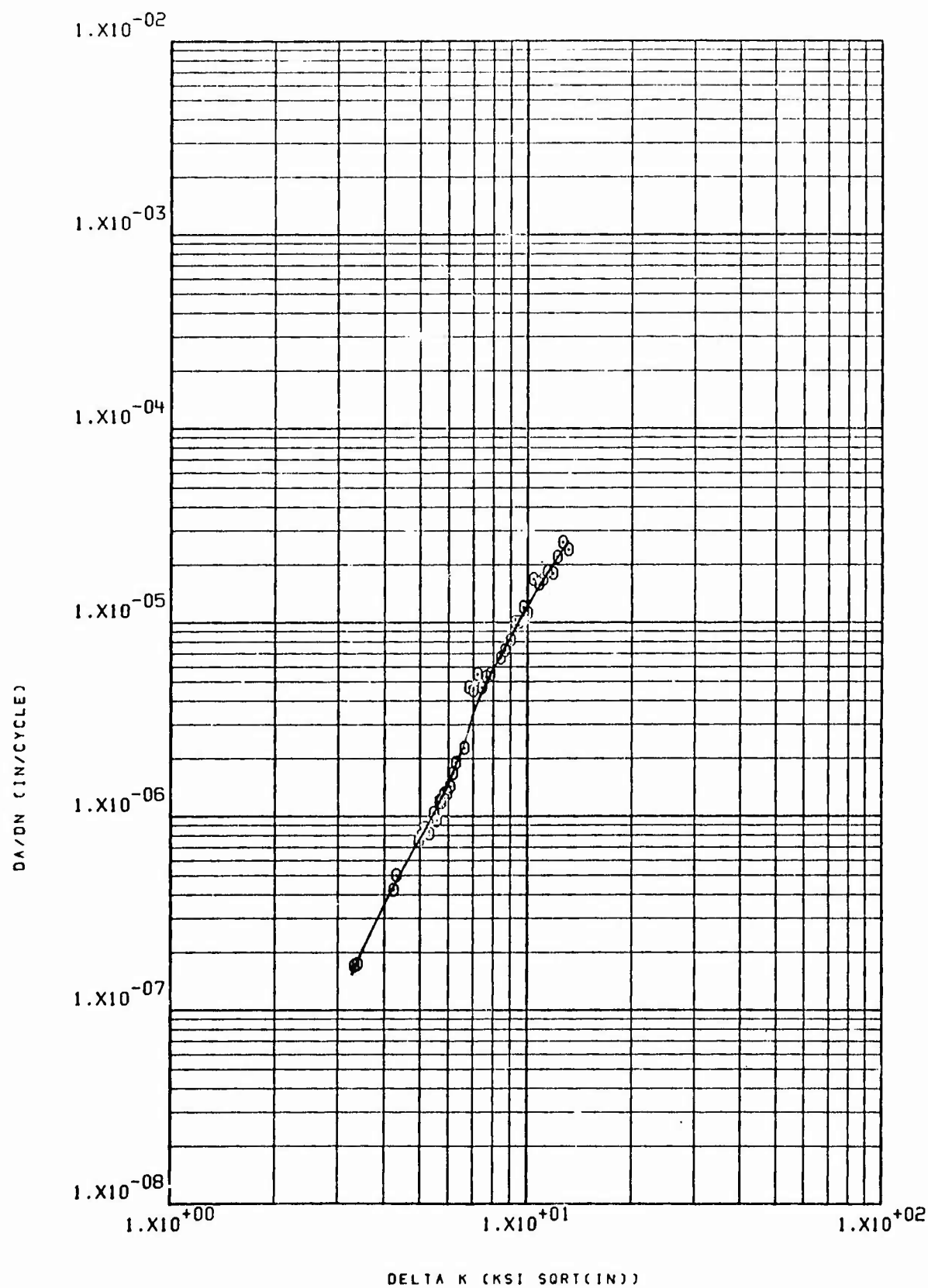




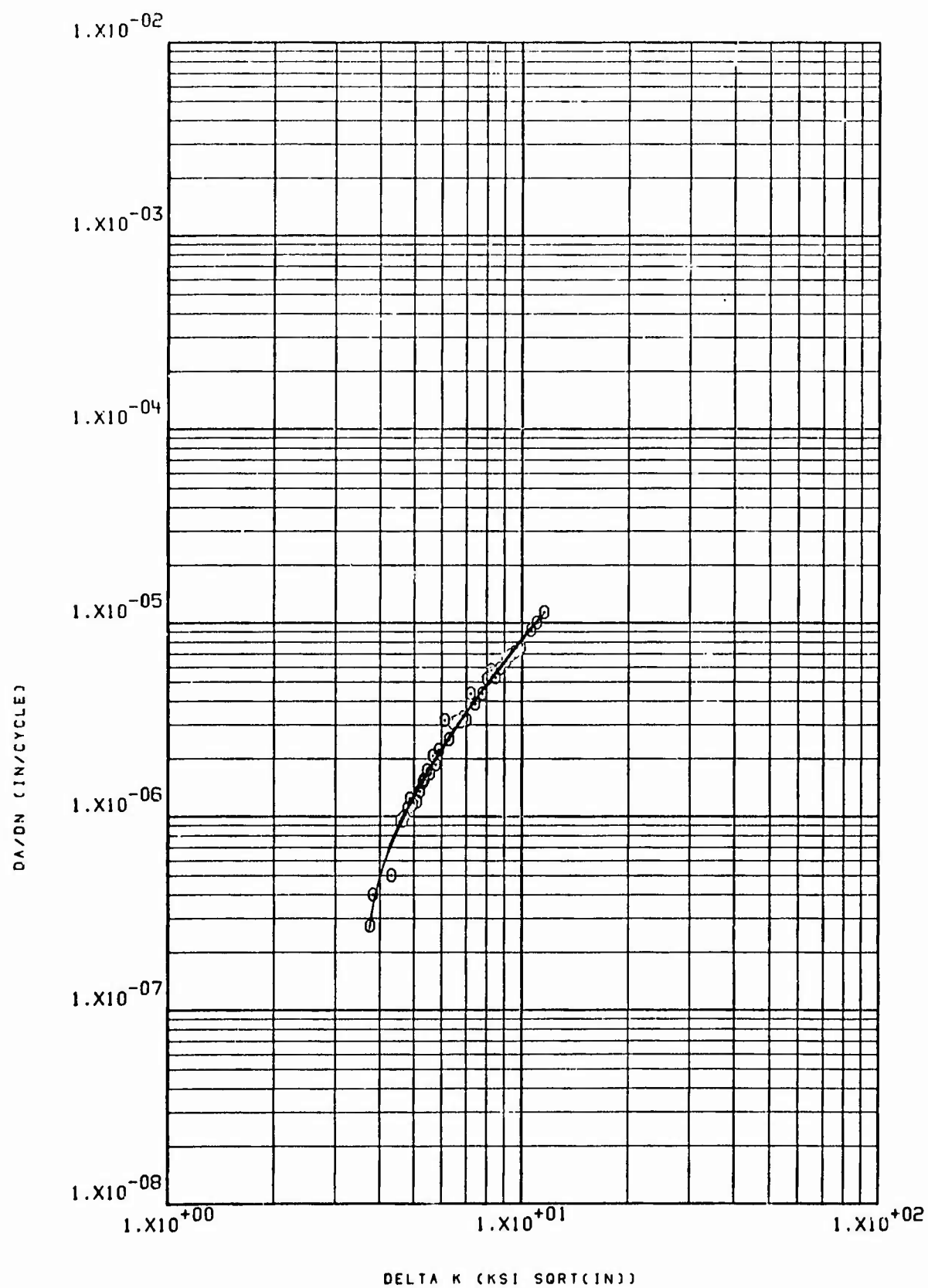


29 NRW 83-3 7075-173511 LHA R1 R=.08 360CPH

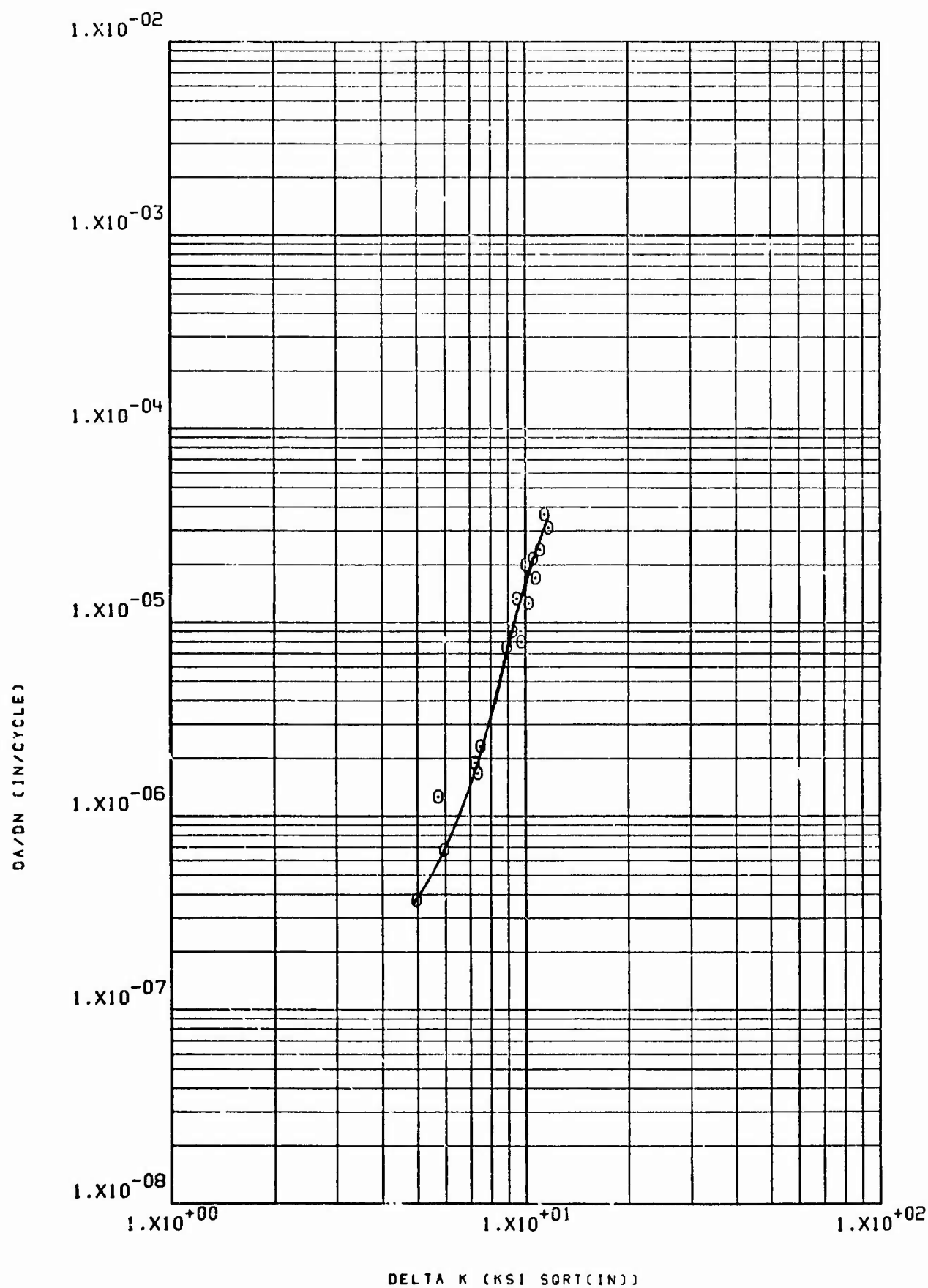


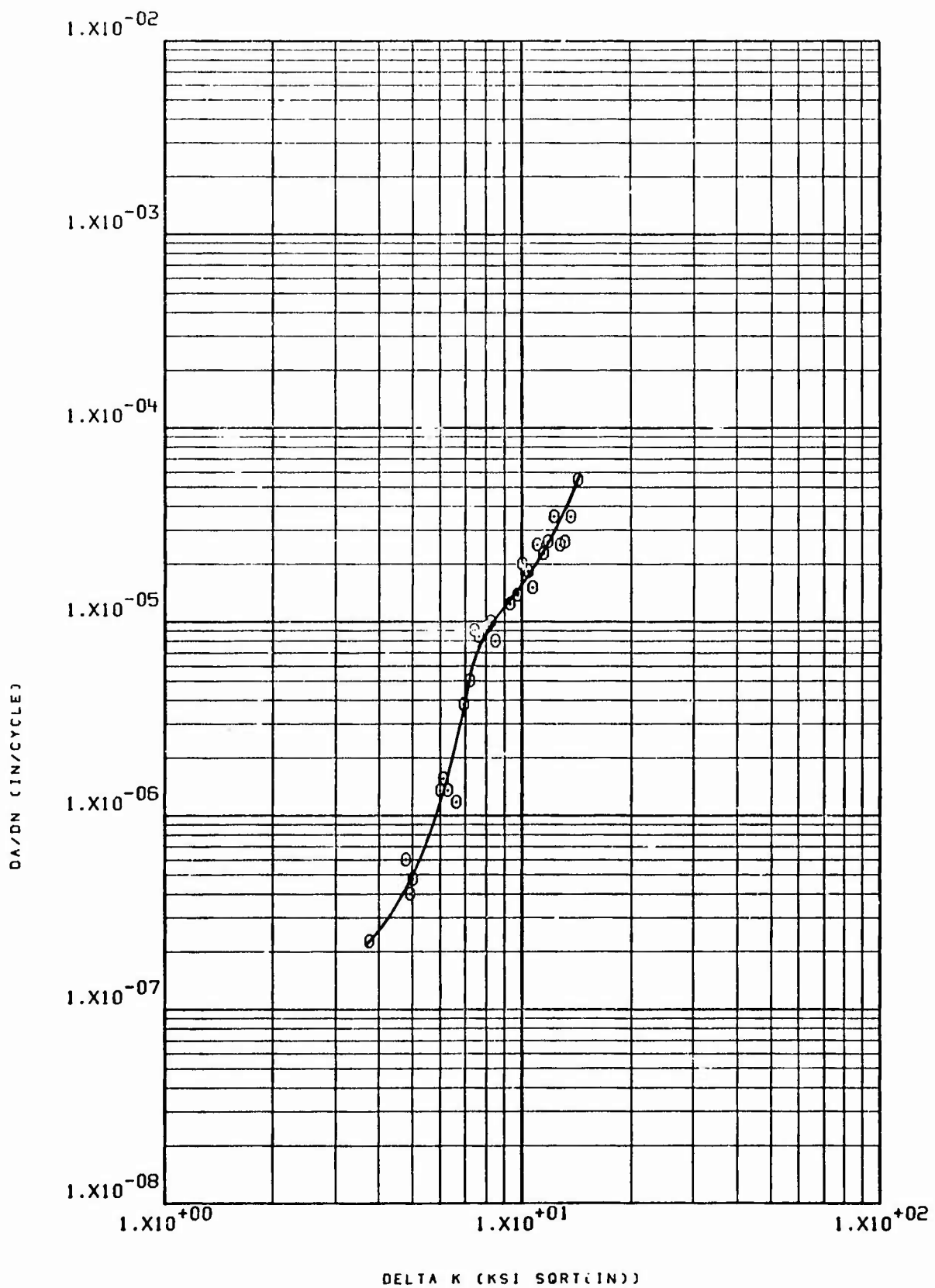


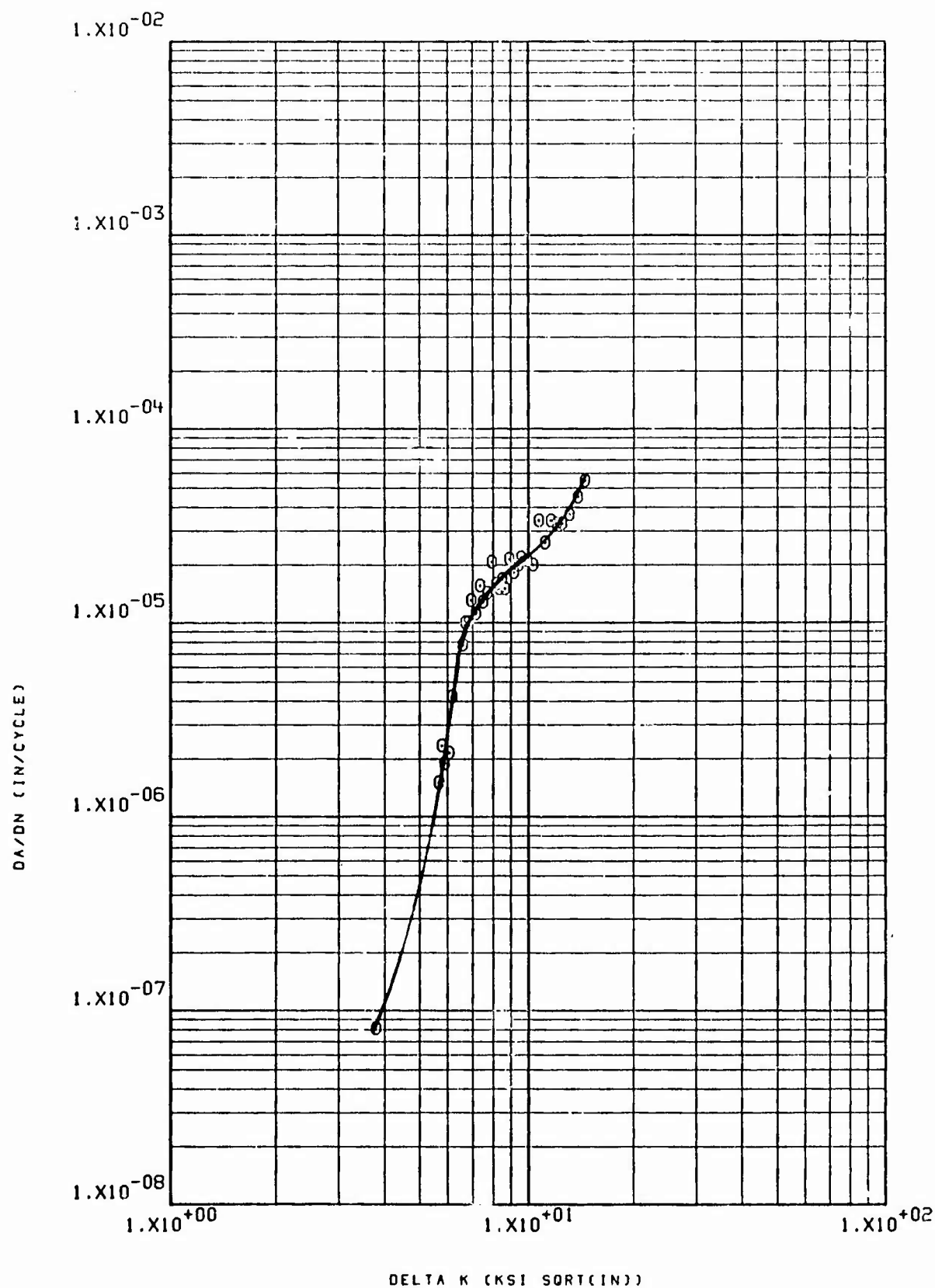
29 NRW 83-5 7075-173511 LHA RT R=.5 360CPM



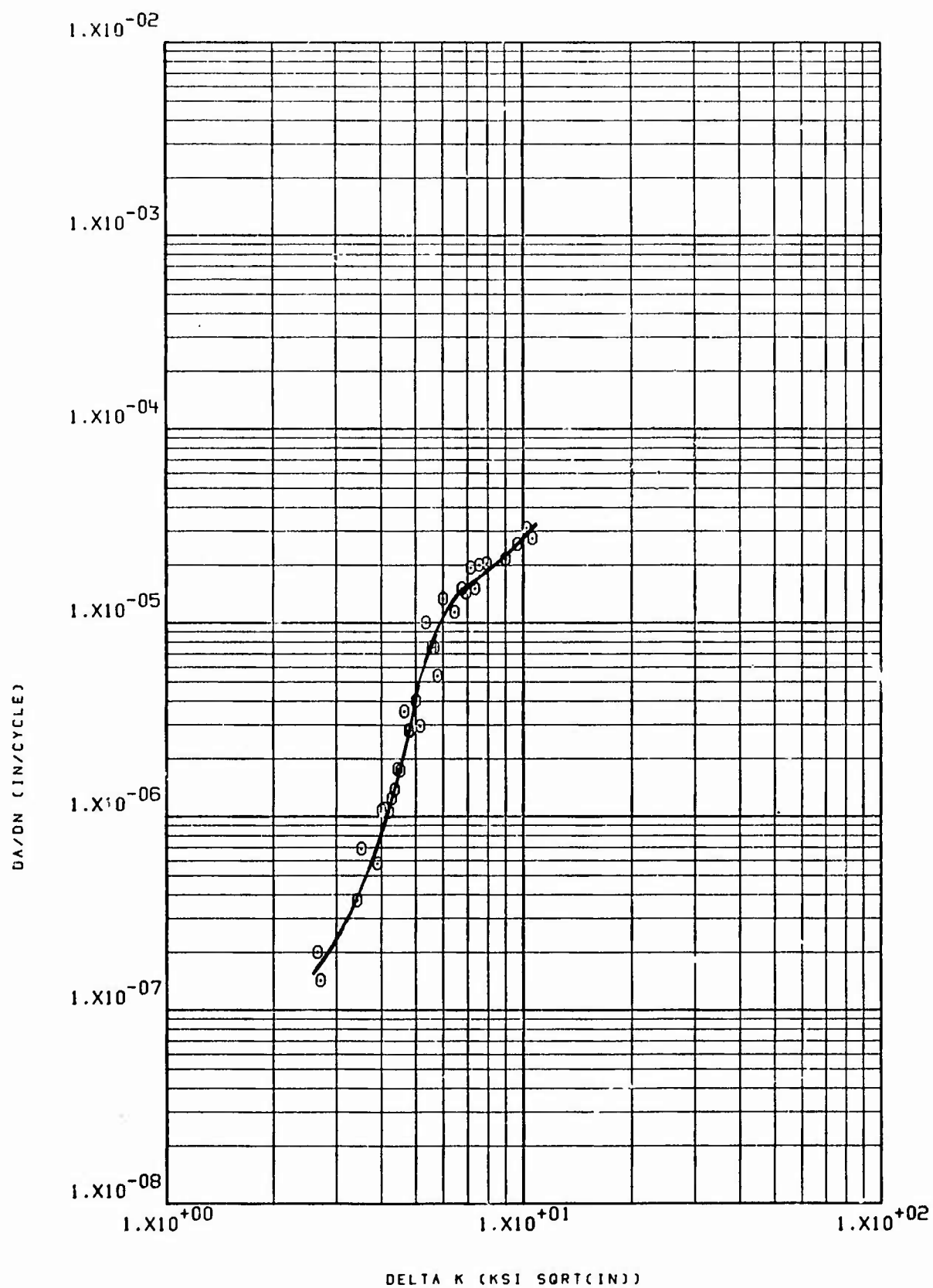
29 NRW 83-6 7075-T73511 LHA 265F R=.08 360CPH

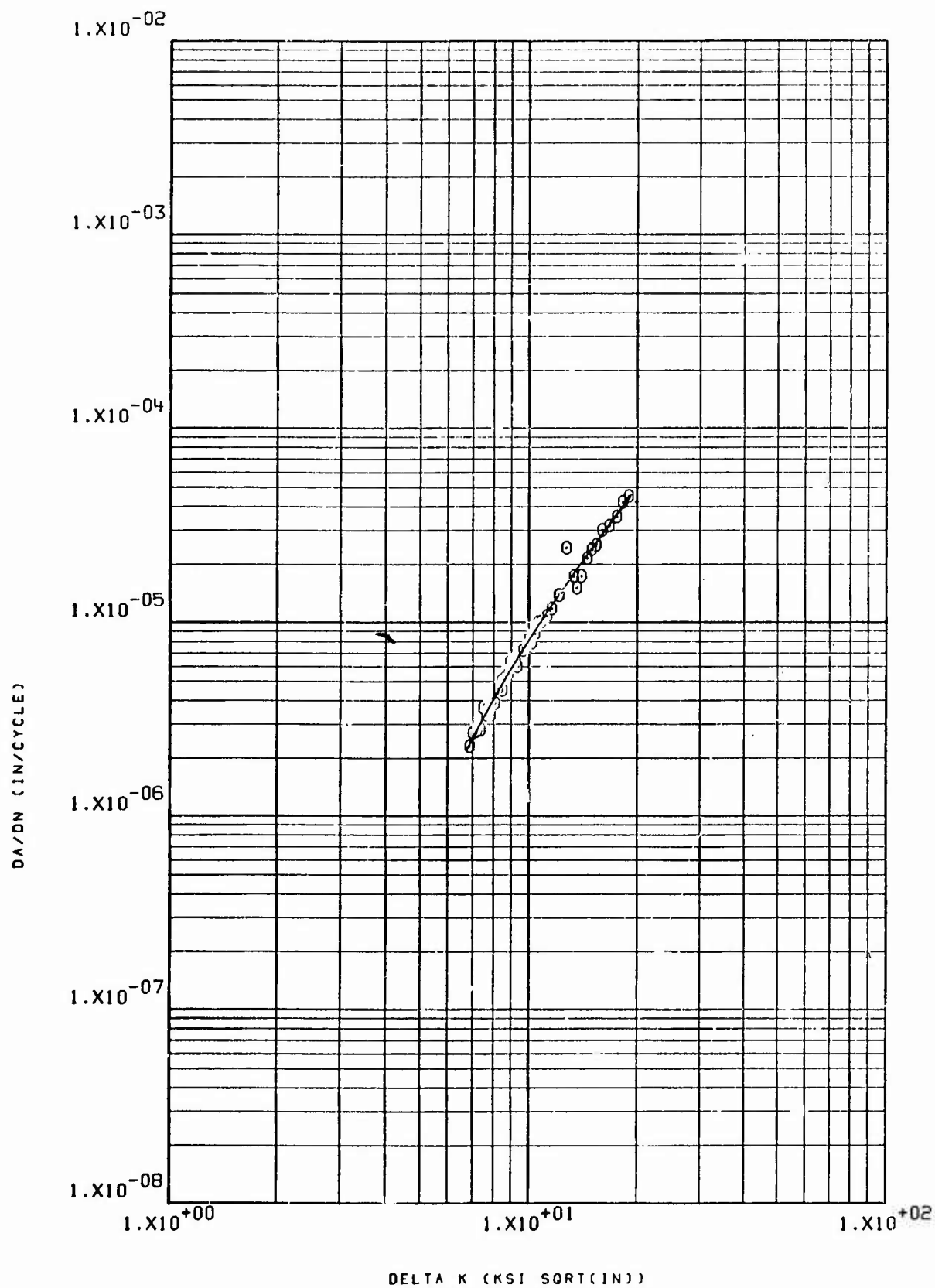


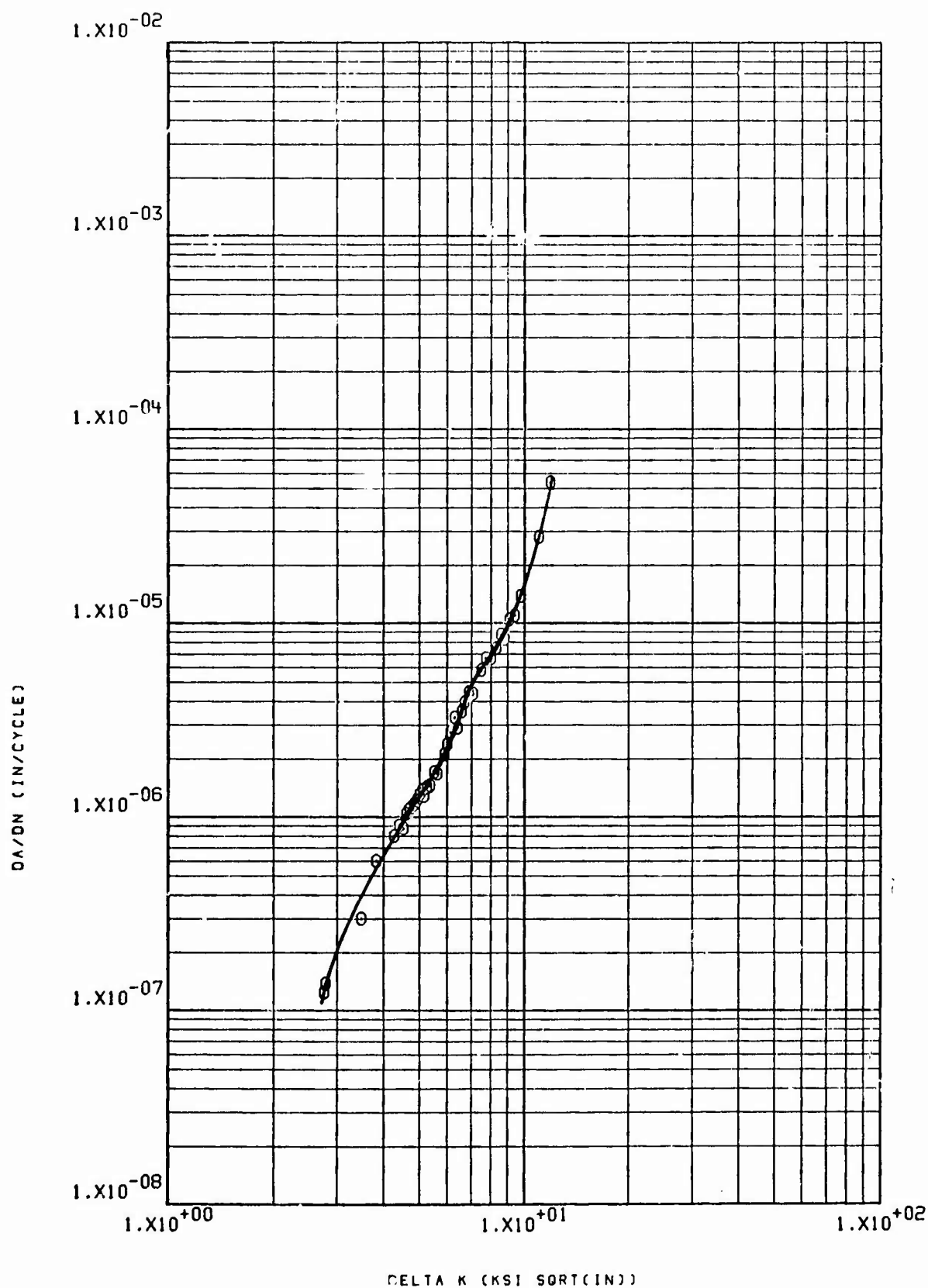


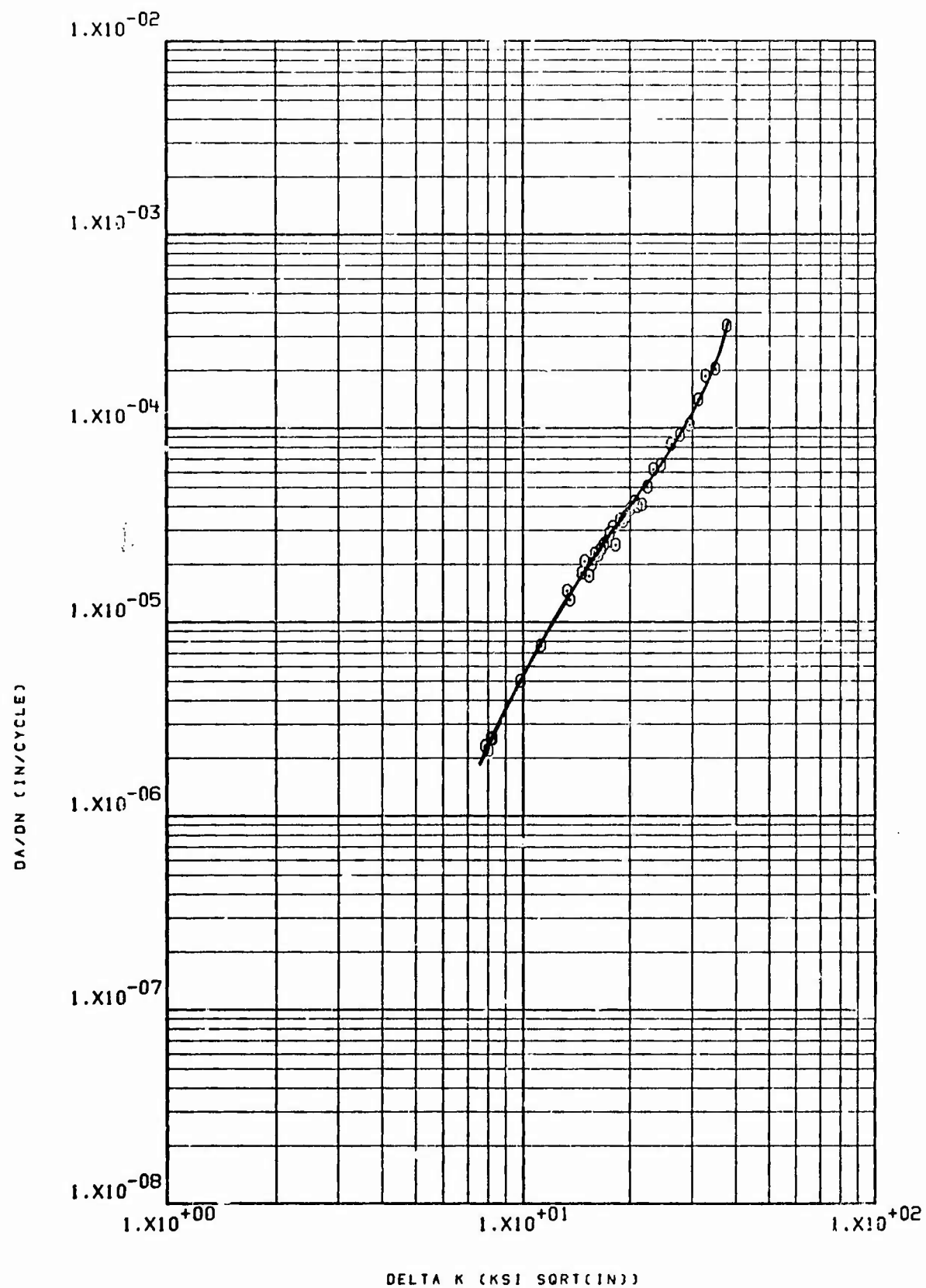


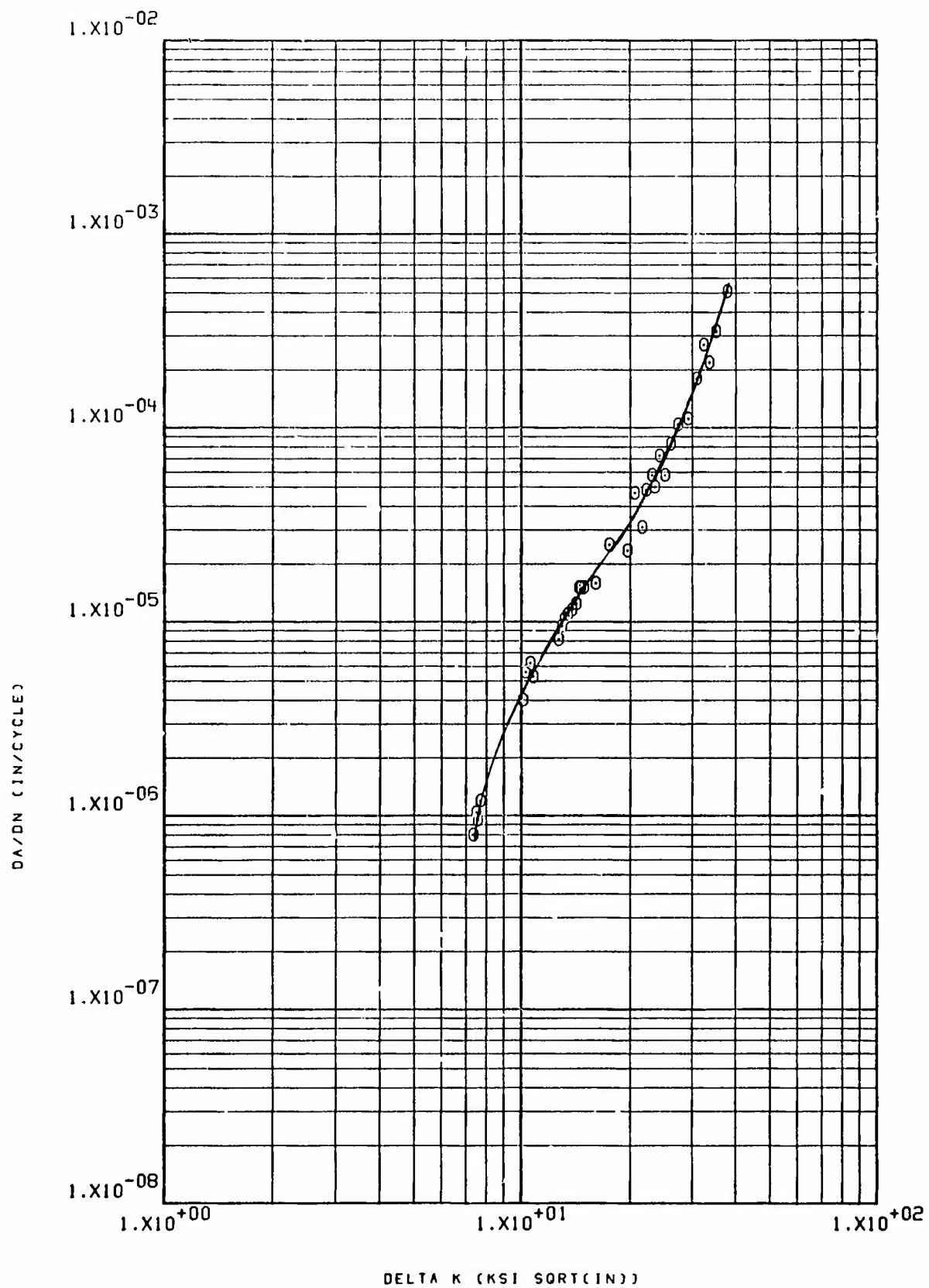
29 NRW 83-9 173511 7075 ALUM EXTRUSION SUMP RT R=.3 60CPM

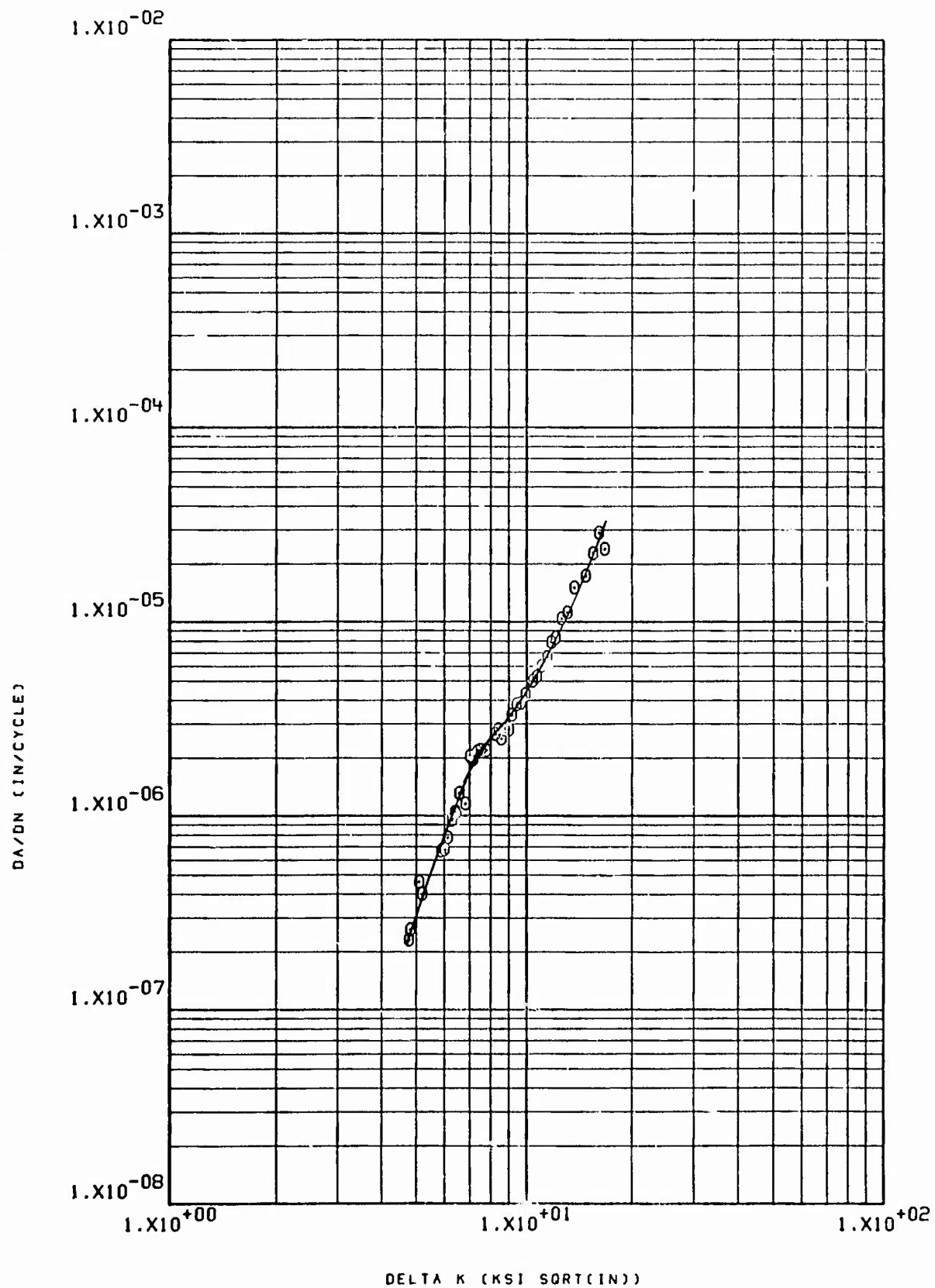


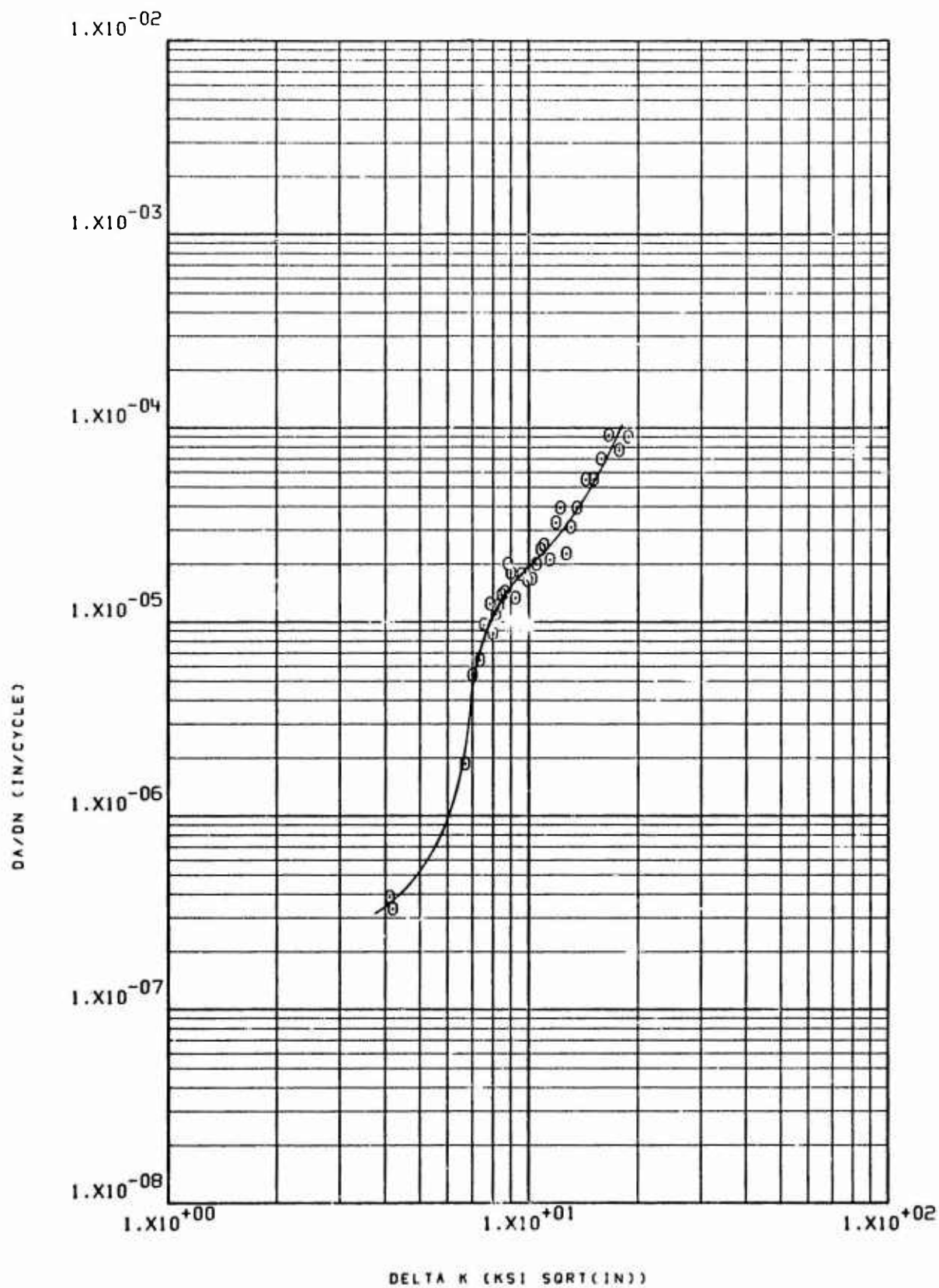


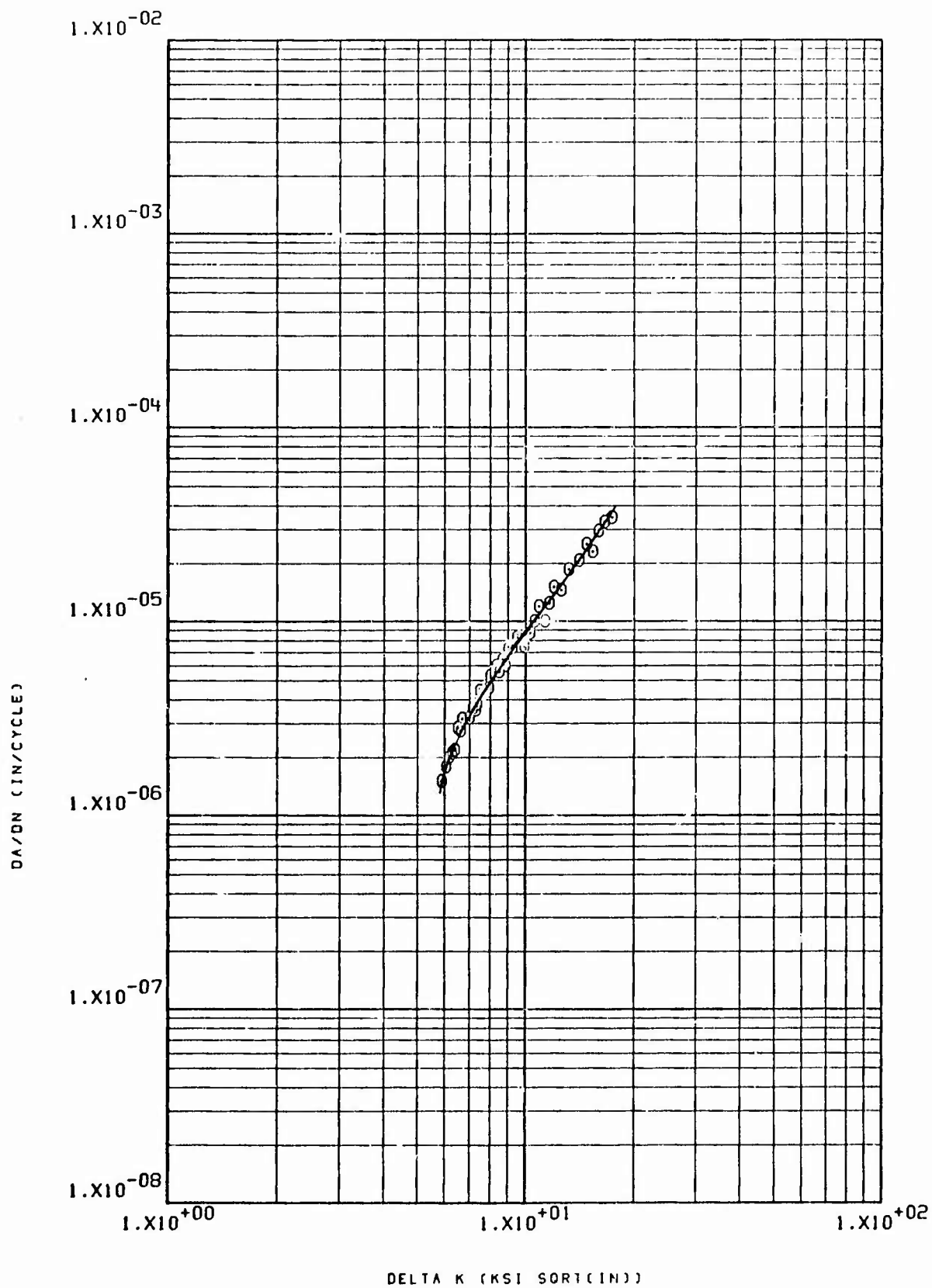




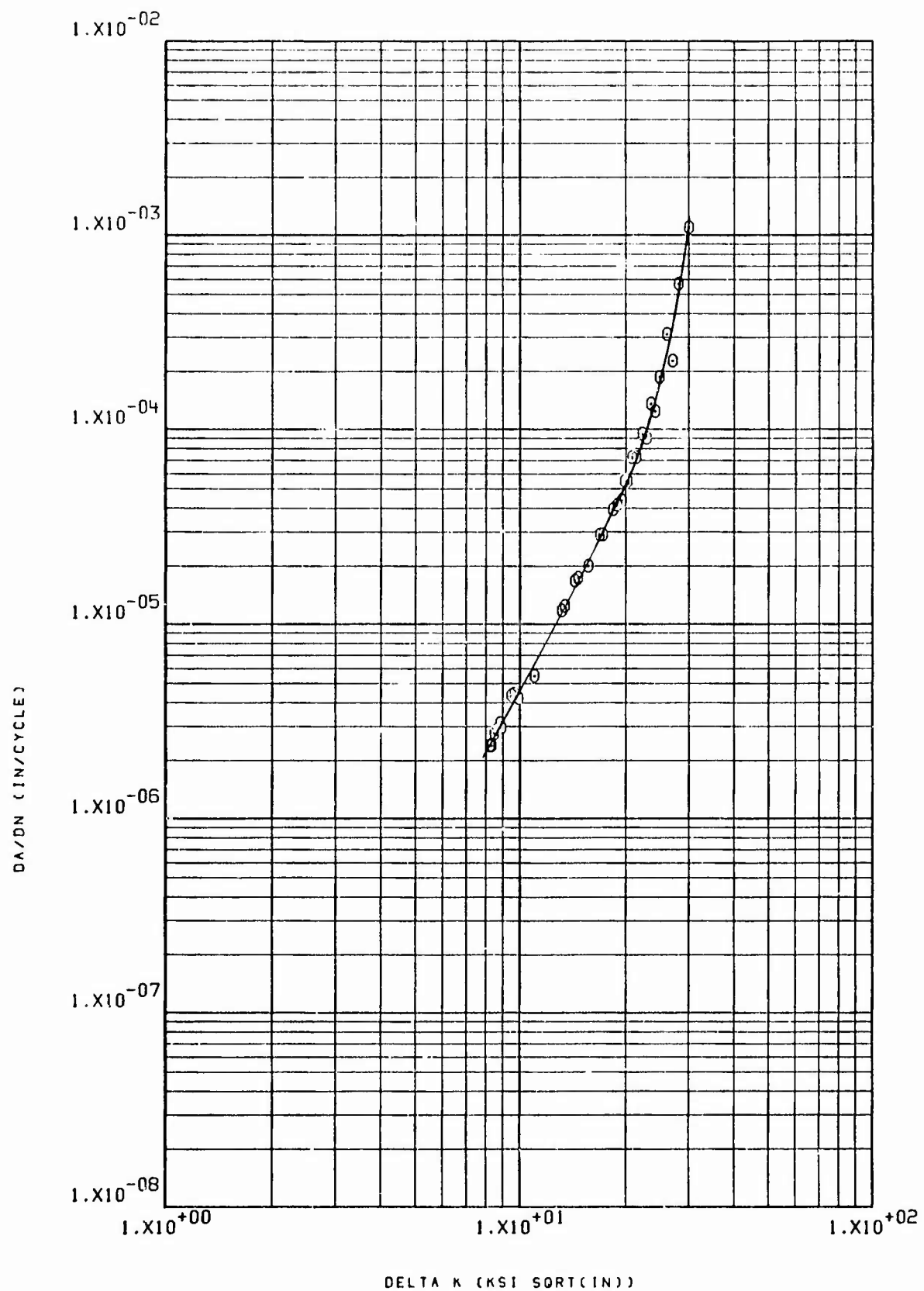




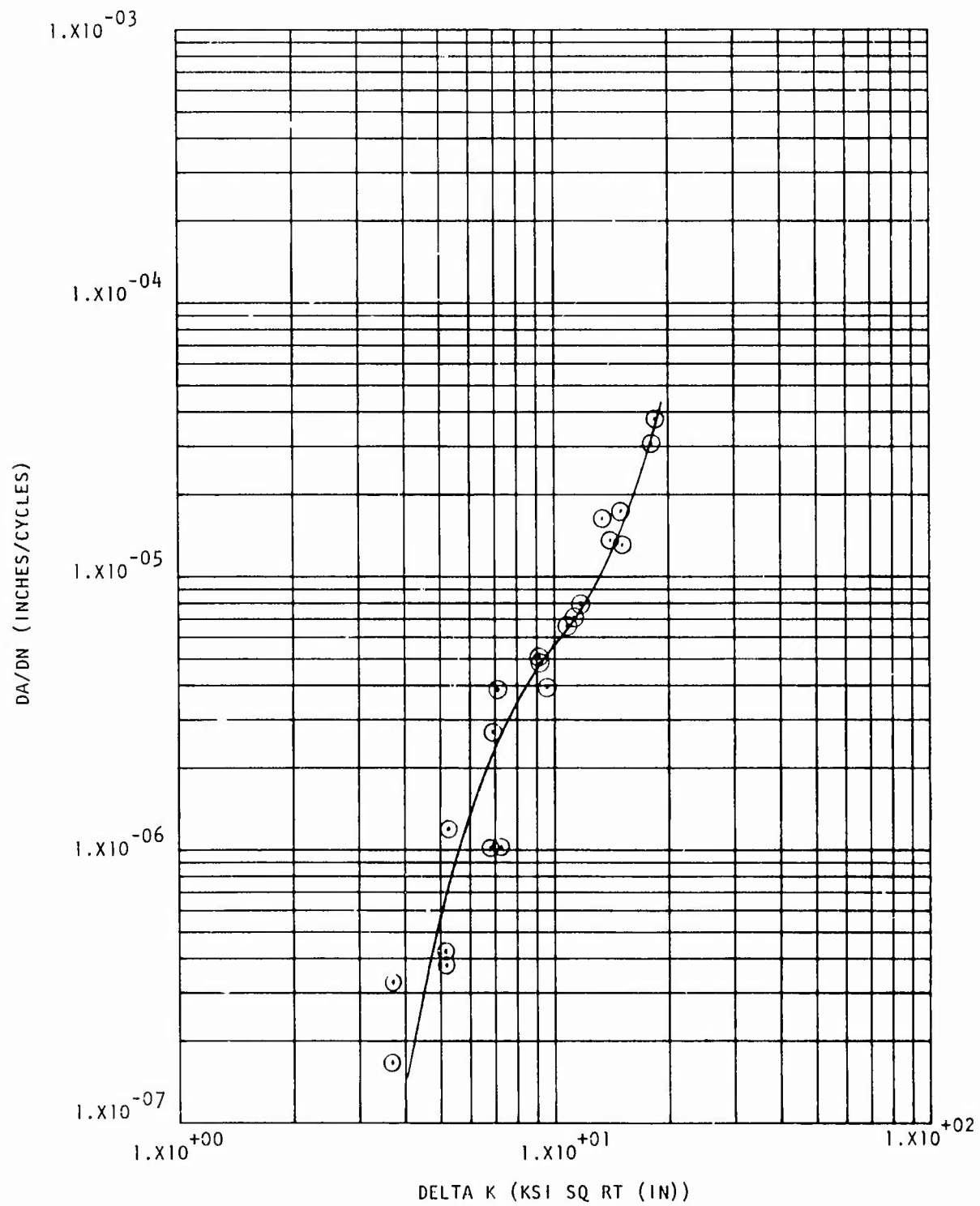




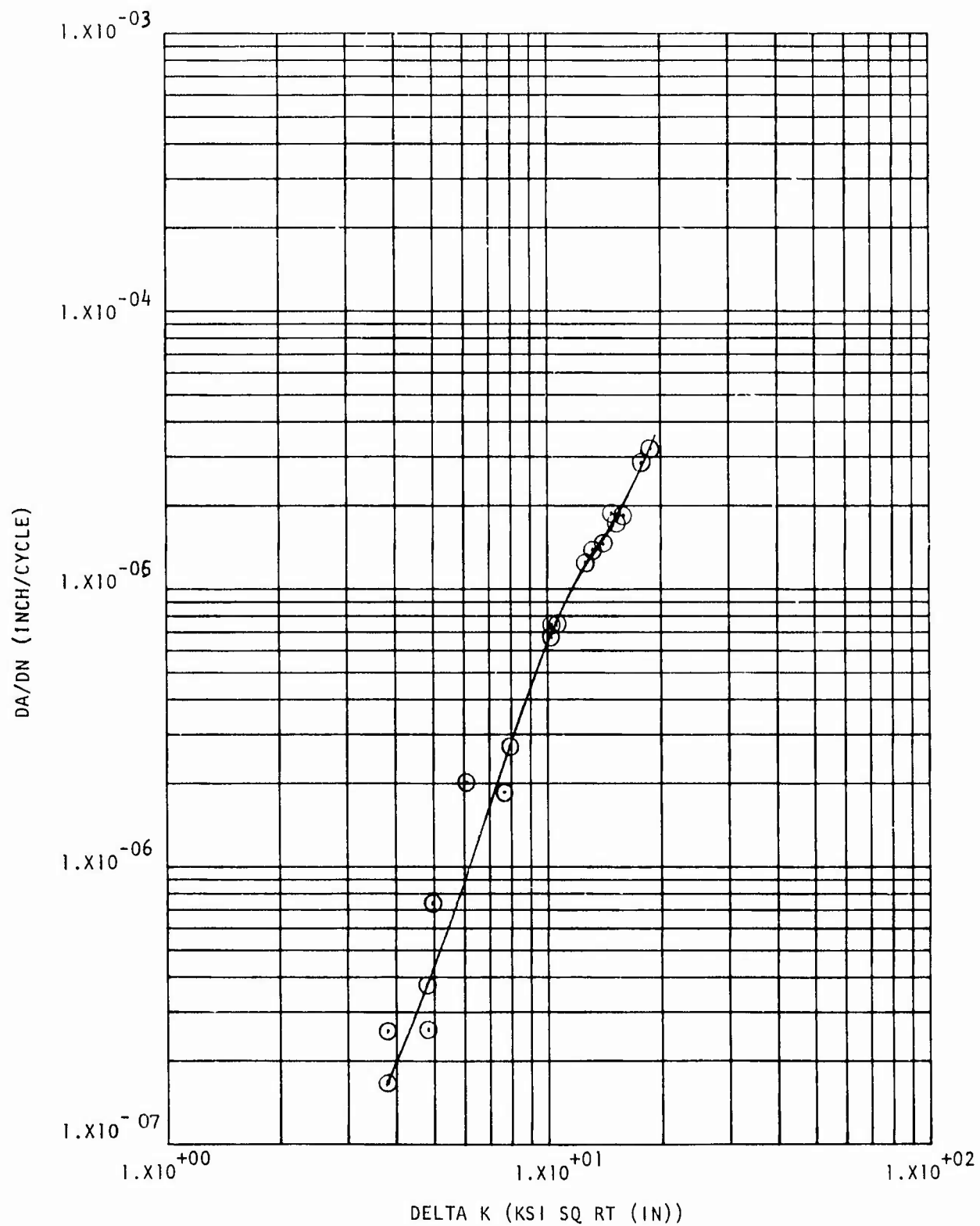
29 NWR 83-17 7075-173511 SHP CLN SOL R=.08 360CPM RT

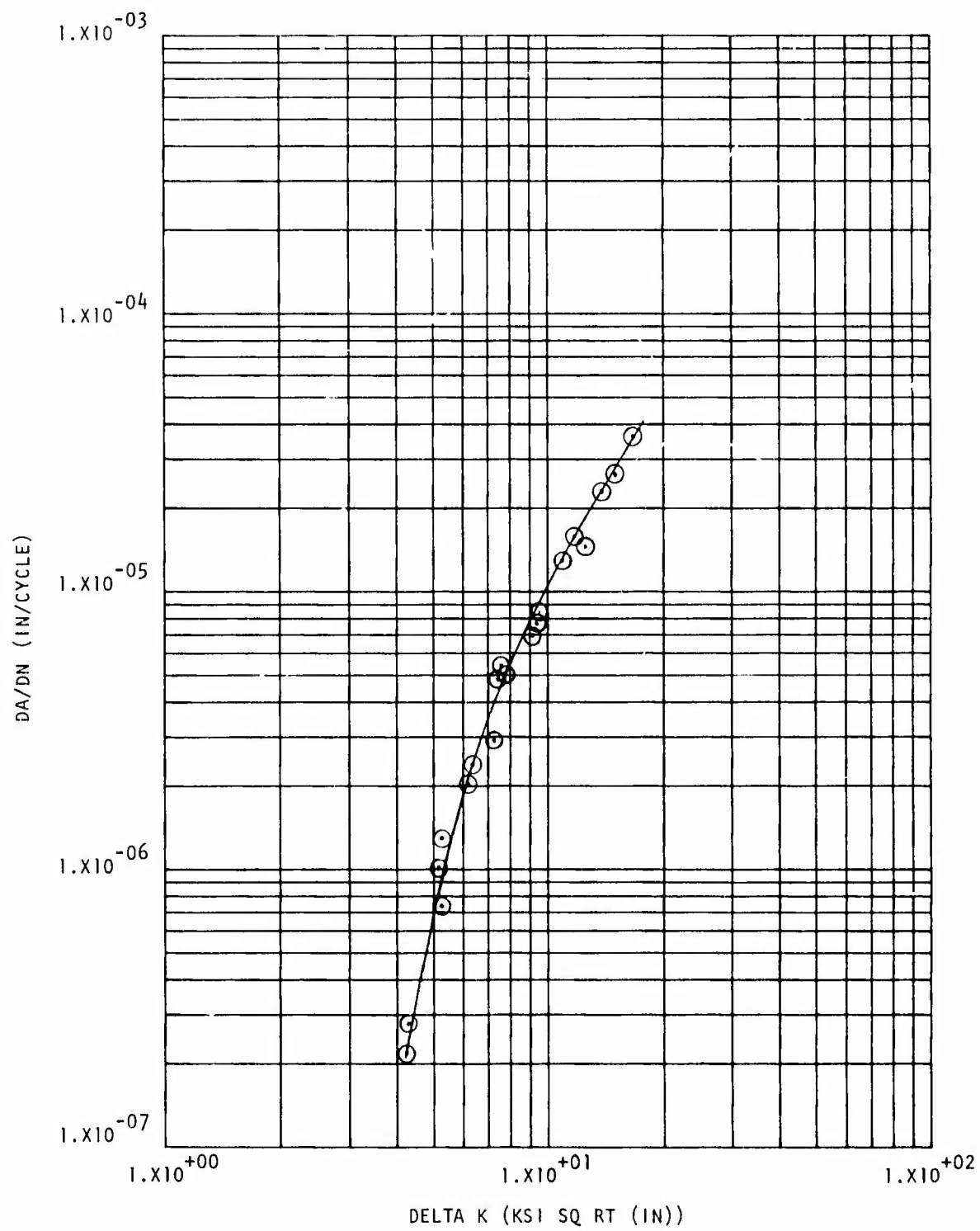


29 NWR 83-18 7075-173511 LHA RT R=.08 360CPH

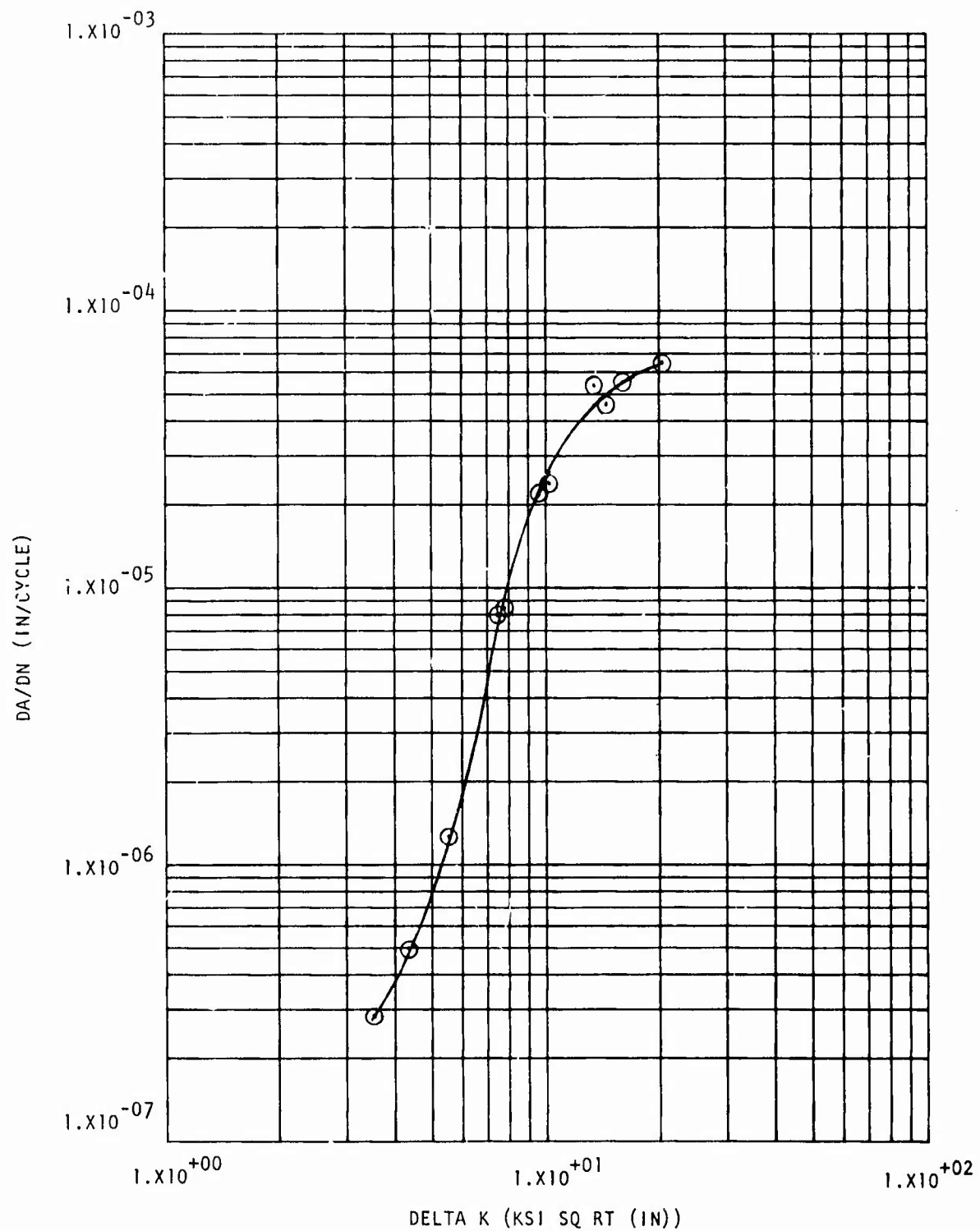


30NRW 85-1 7075-T76 LHA RT R = 0.08 60 CPM

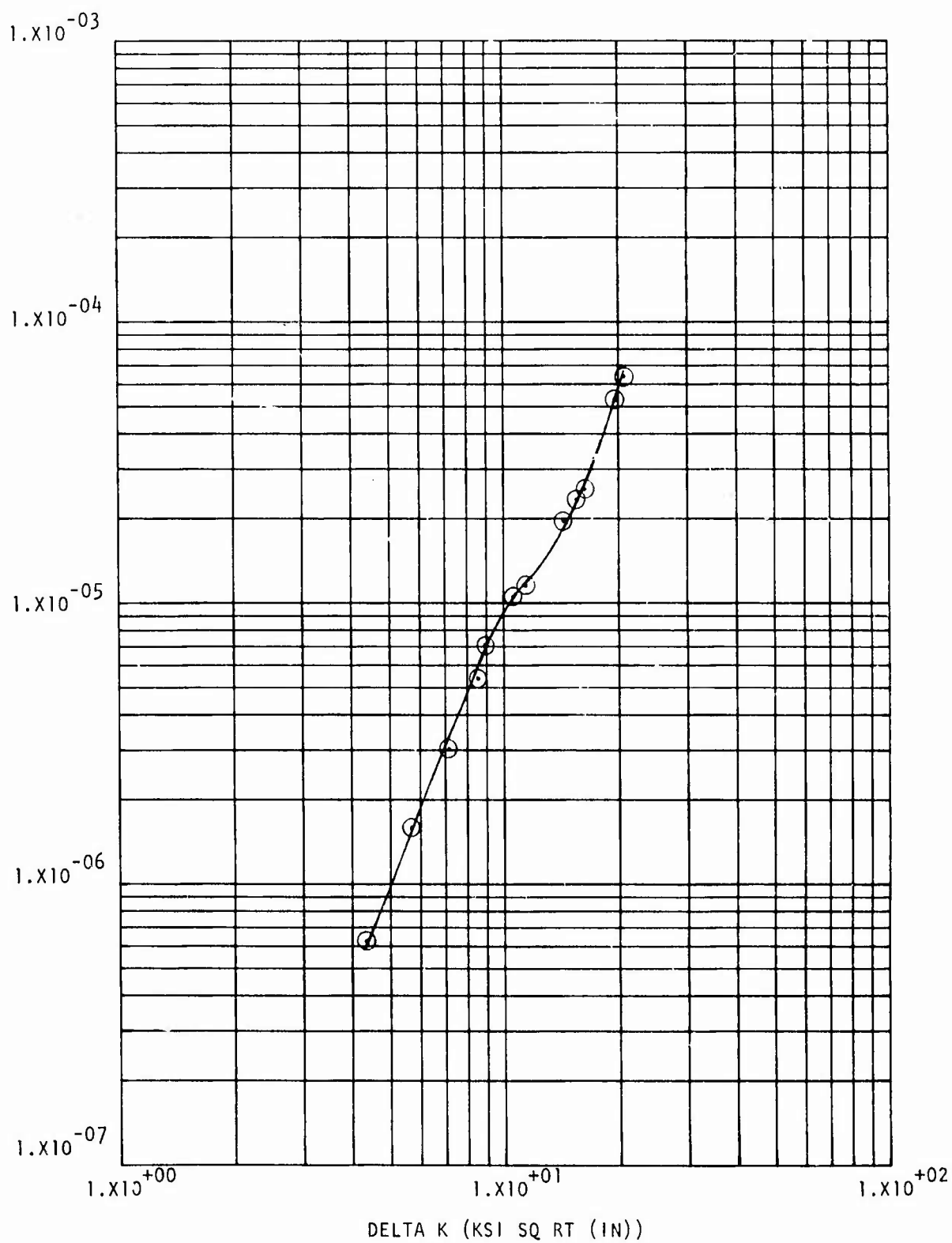




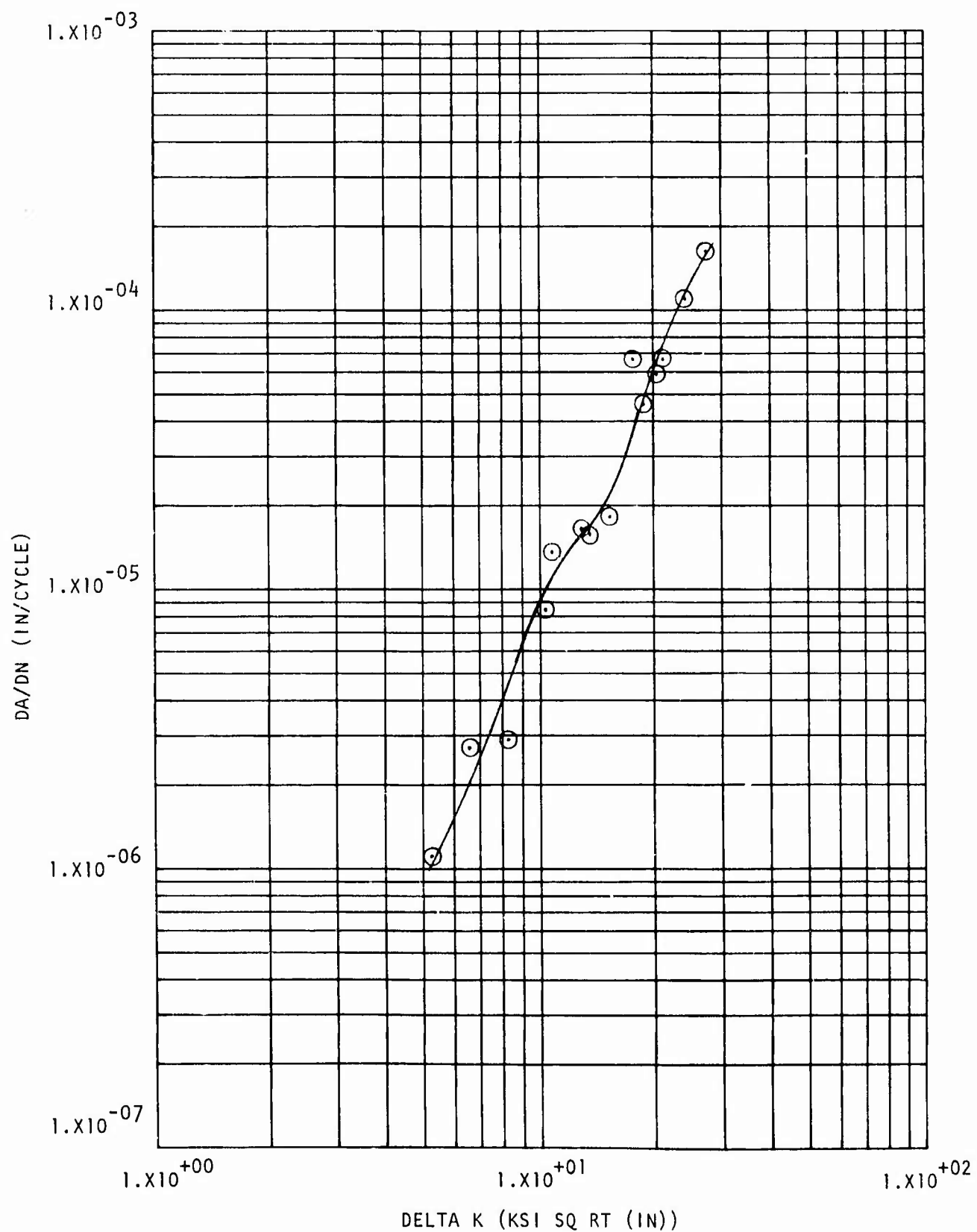
30 NRW 85-3 7075-T76 LHA RT R = 0.3 360 CPM



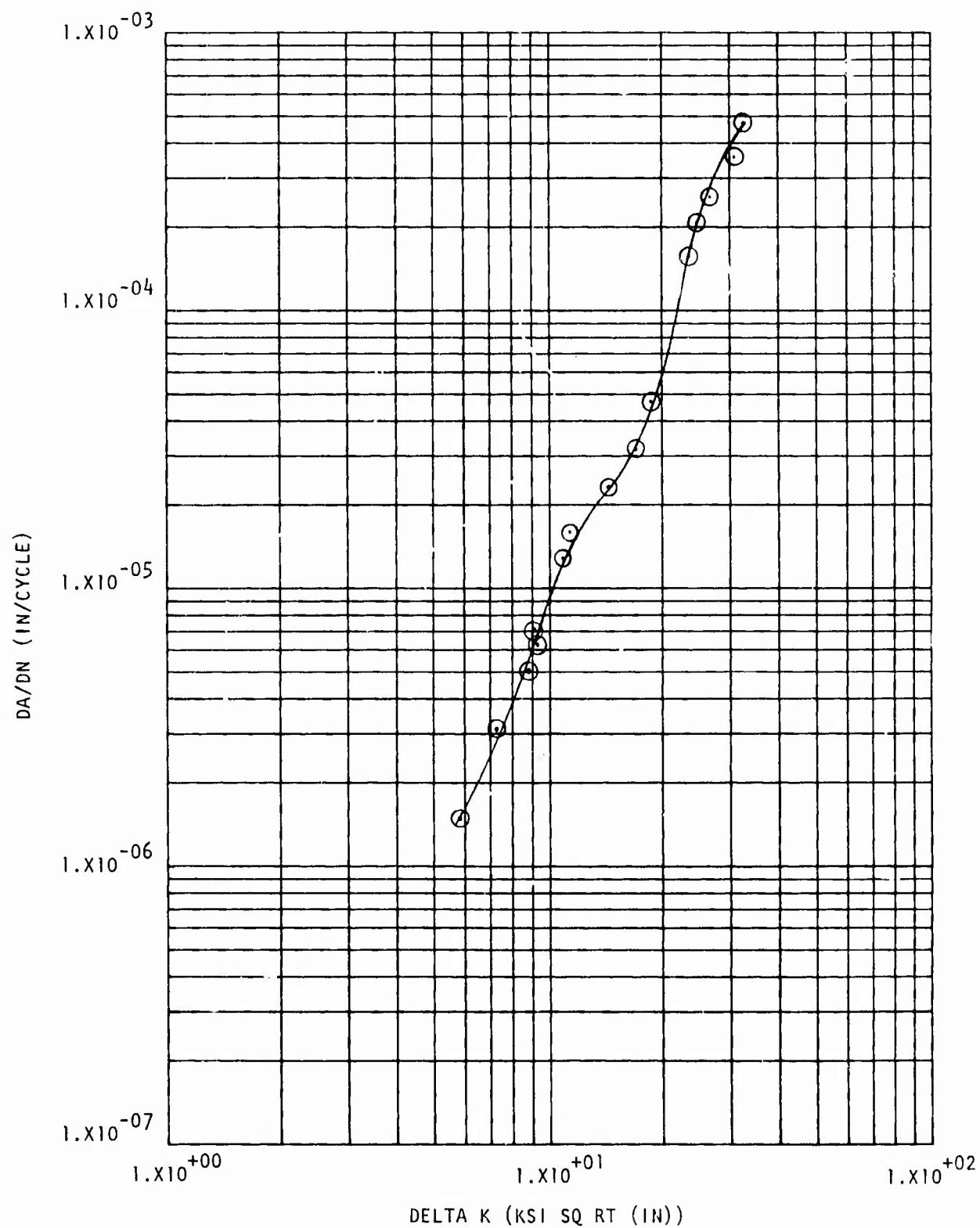
30 NRW 85-4 7075-T76 STW RT R = 0.08 60 CPM



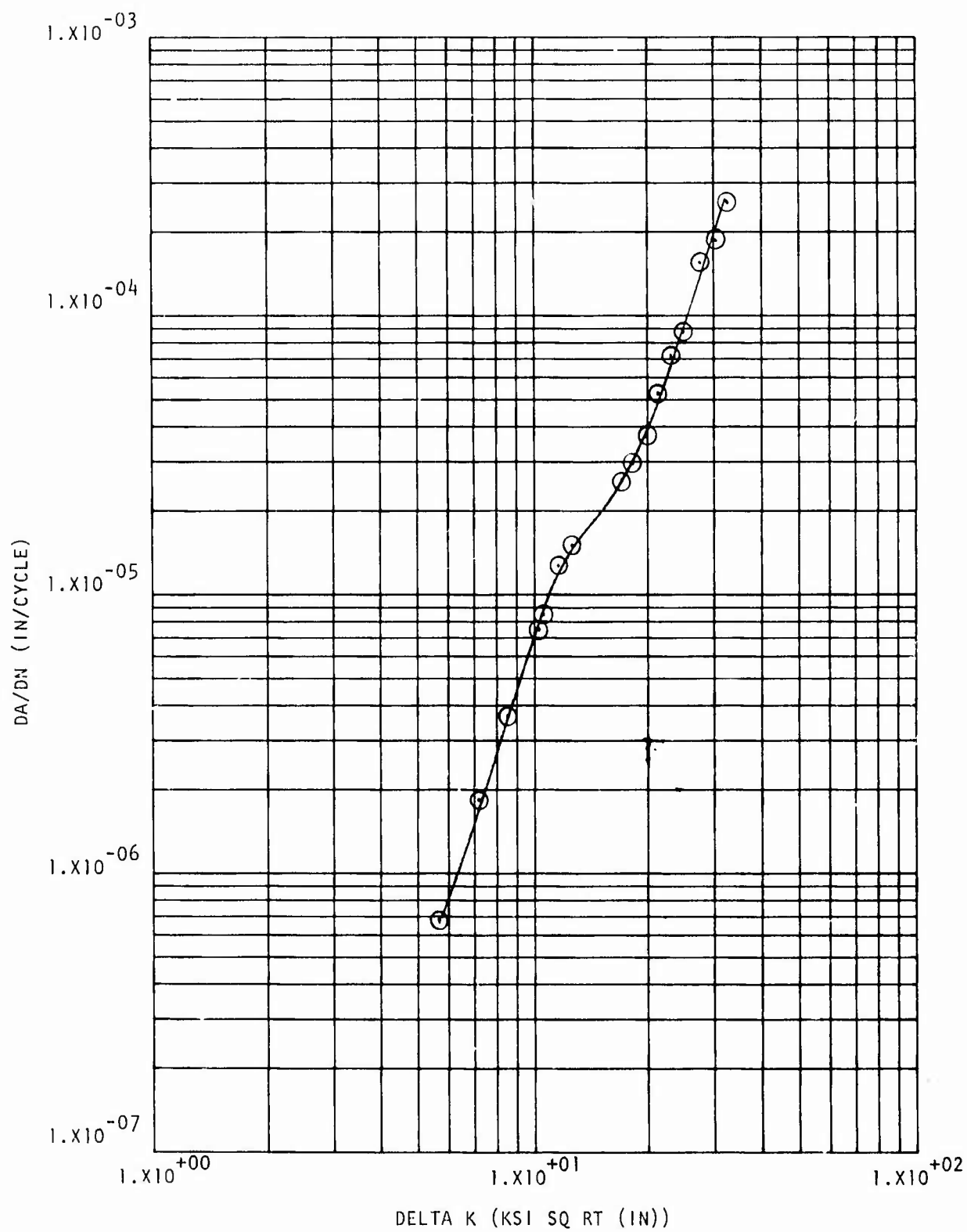
30 NRW 85-5 7075-T76 SCS RT R = 0.08 60 CPM



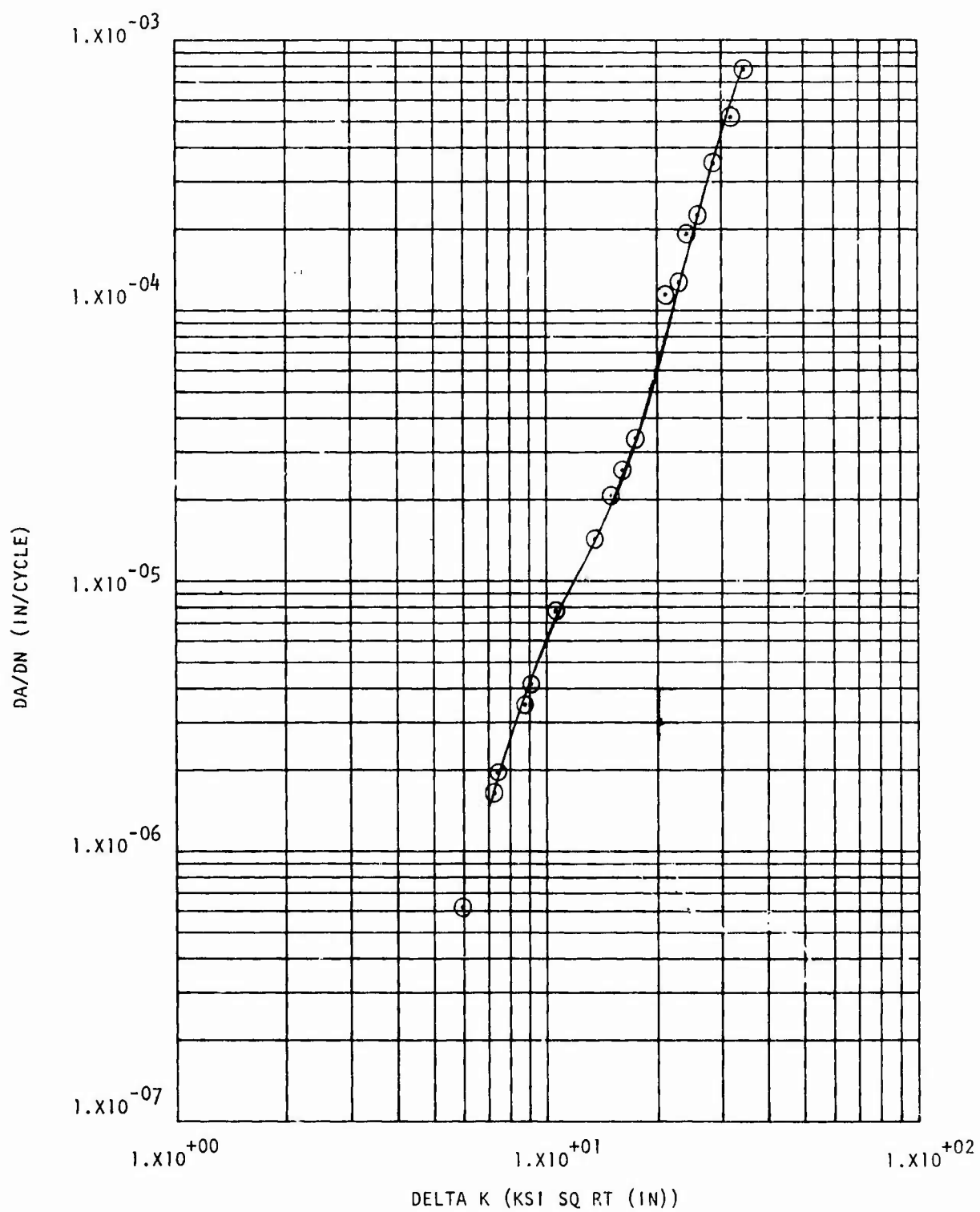
30 NRW 85-7 7075-T76 FREON TF RT R = 0.08 60 CPM



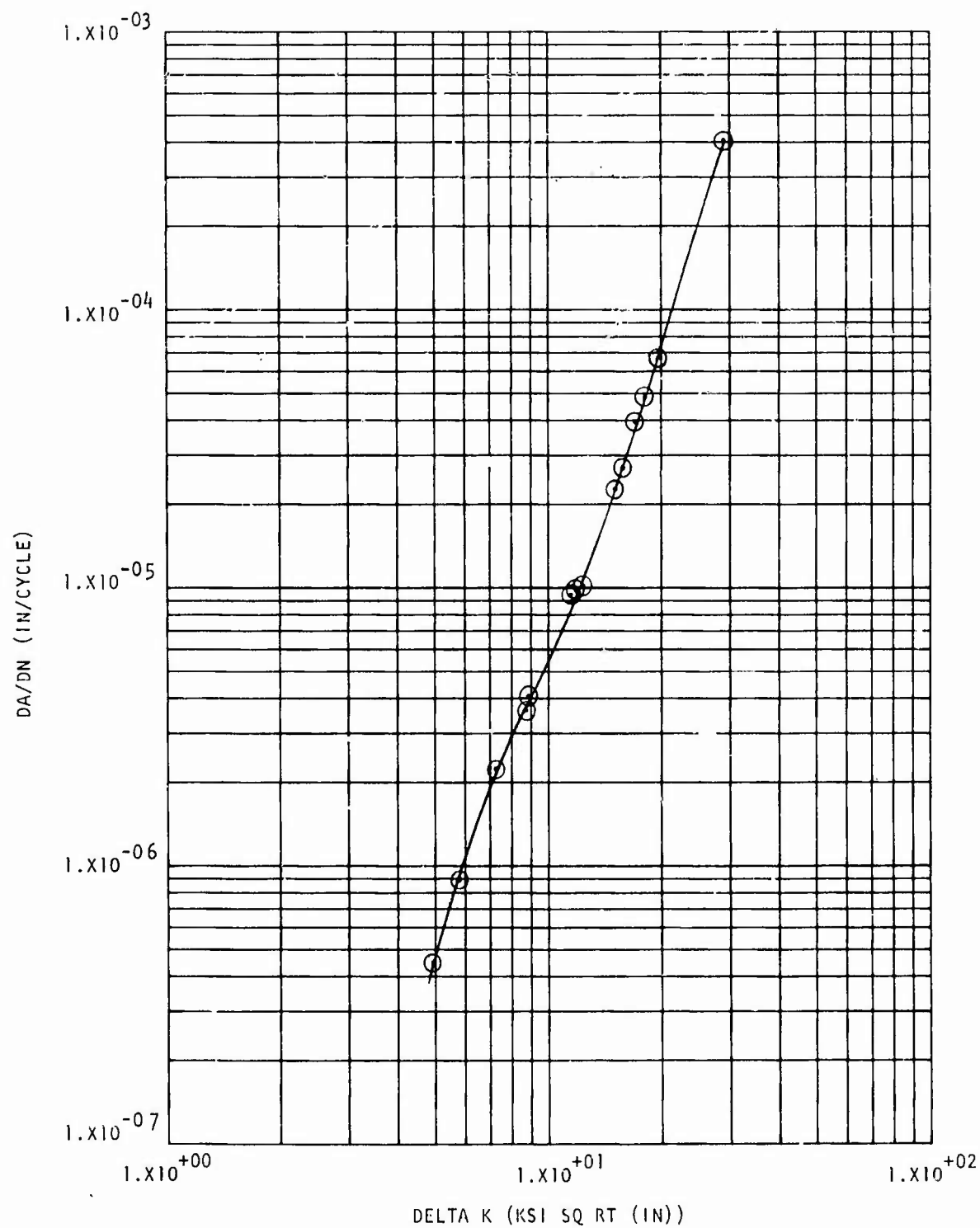
30 NWR 85-12 7075-T76 LHA RT R = 0.08 360 CPM



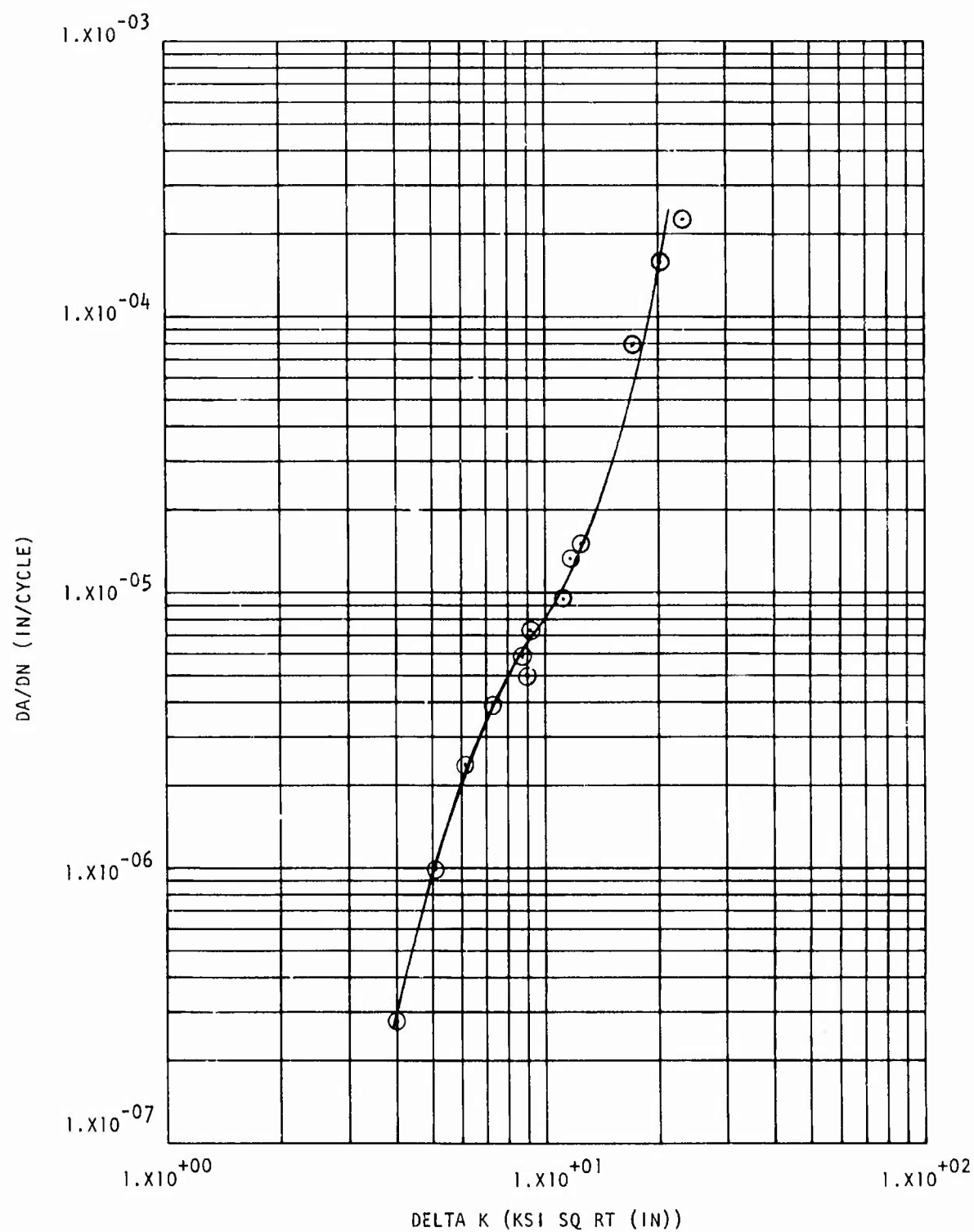
301 NRW 86-4 7075-T76 LHA RT R = 0.08 360 CPM



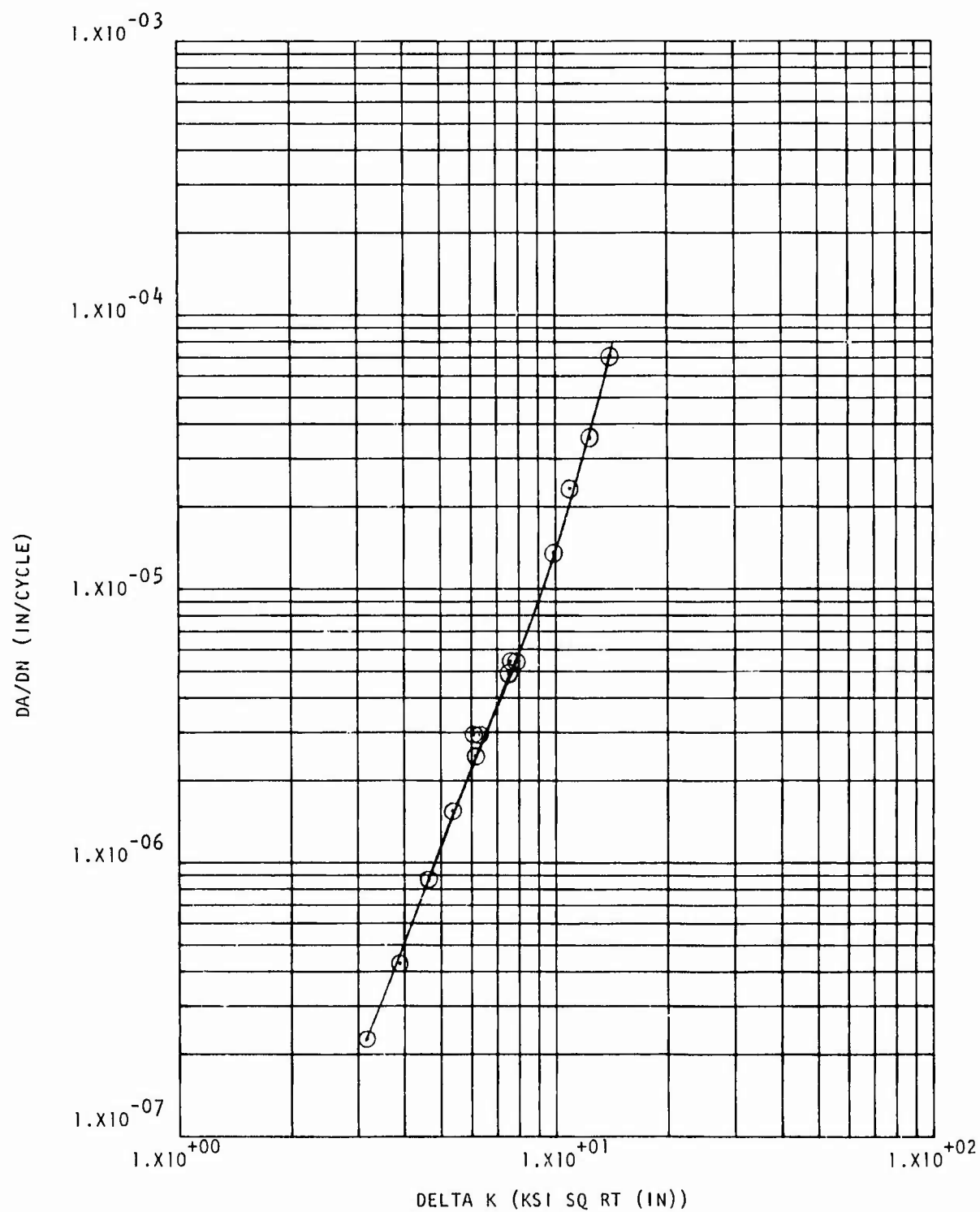
302 NRW 87-1 2024-T81 LHA RT R = 0.08 60 CPM



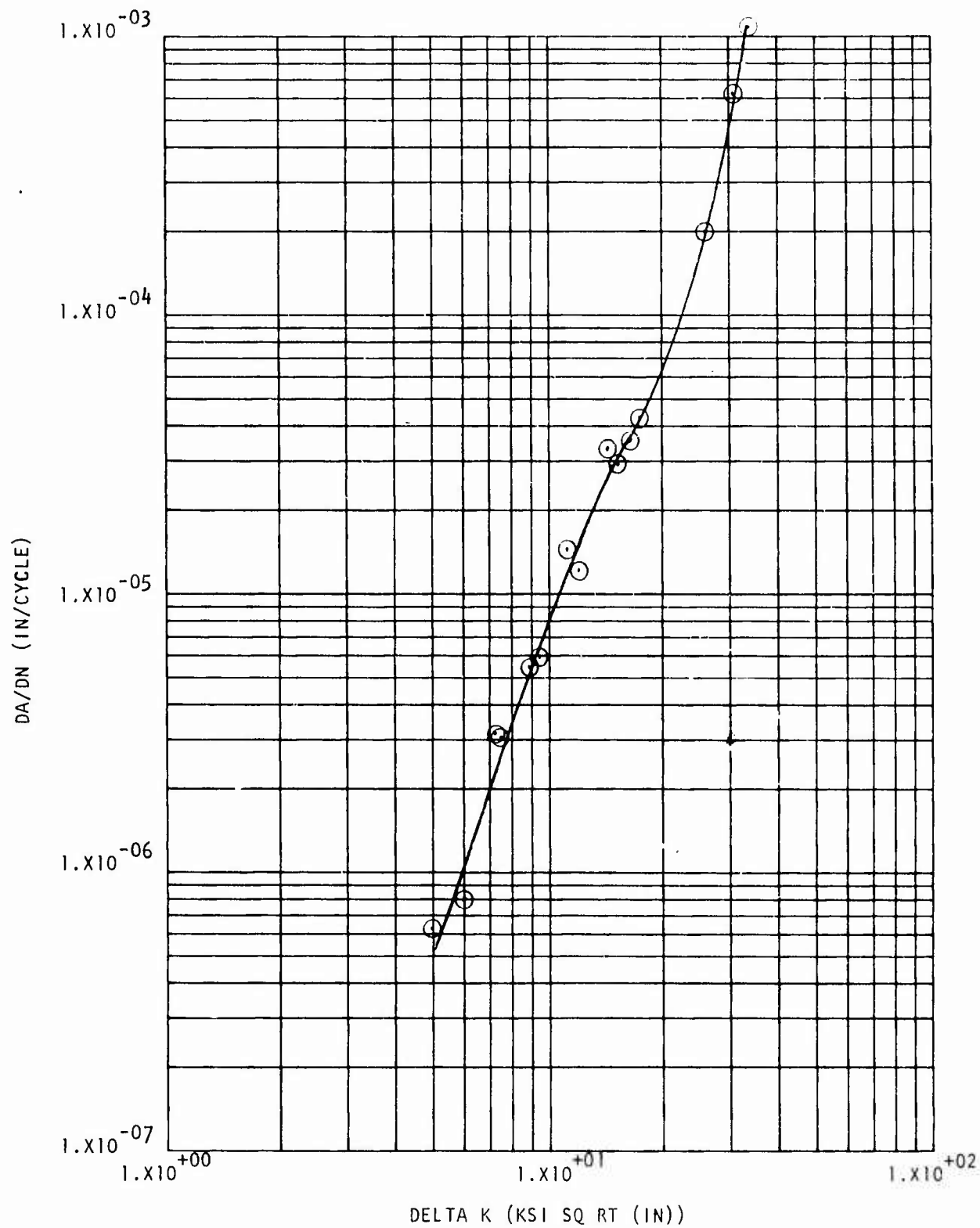
302 NRW 87-2 2024-T81 LHA RT R = 0.08 360 CPM



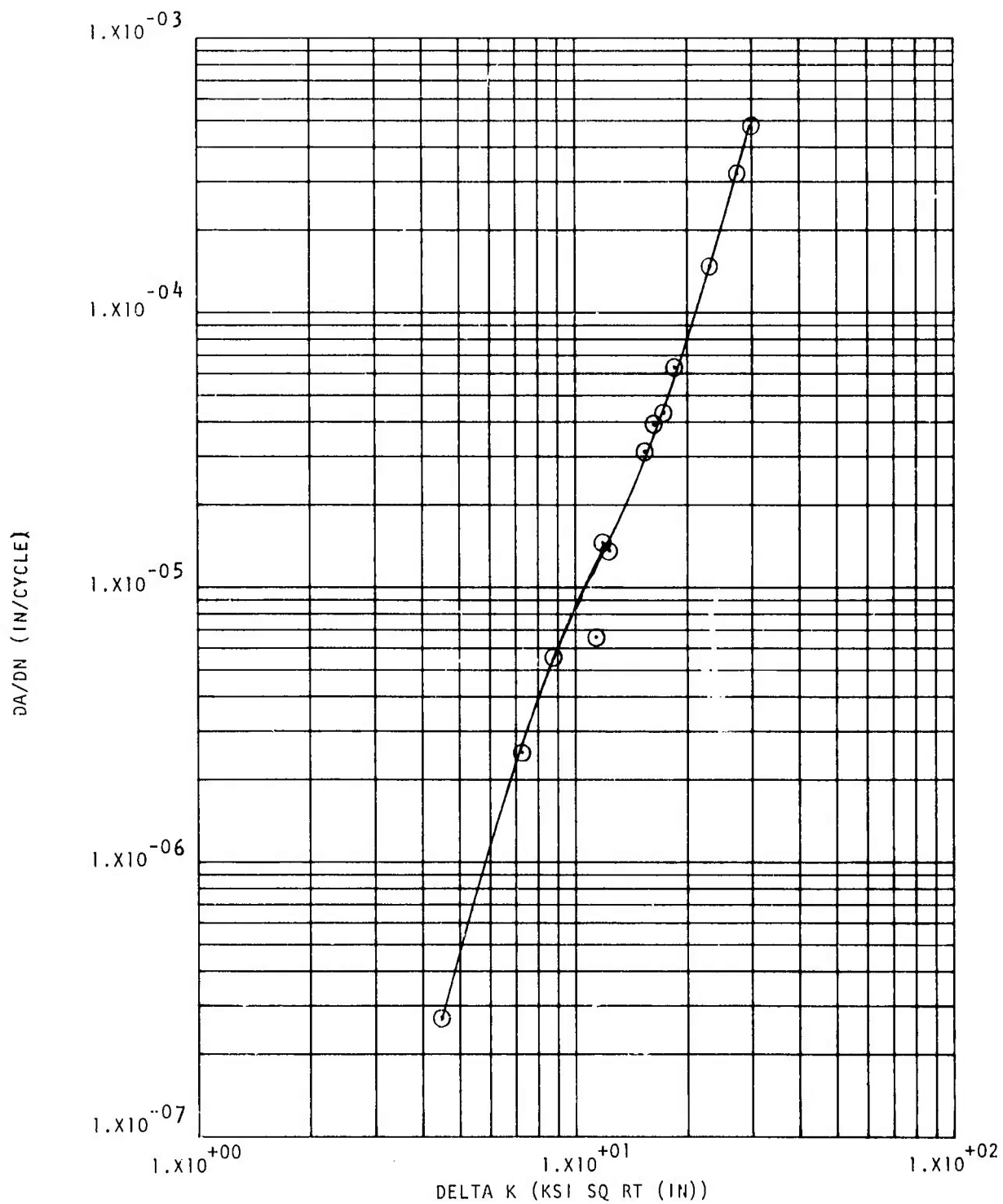
302 NRW 87-3 2024-T81 LHA RT R = 0.3 360 CPM



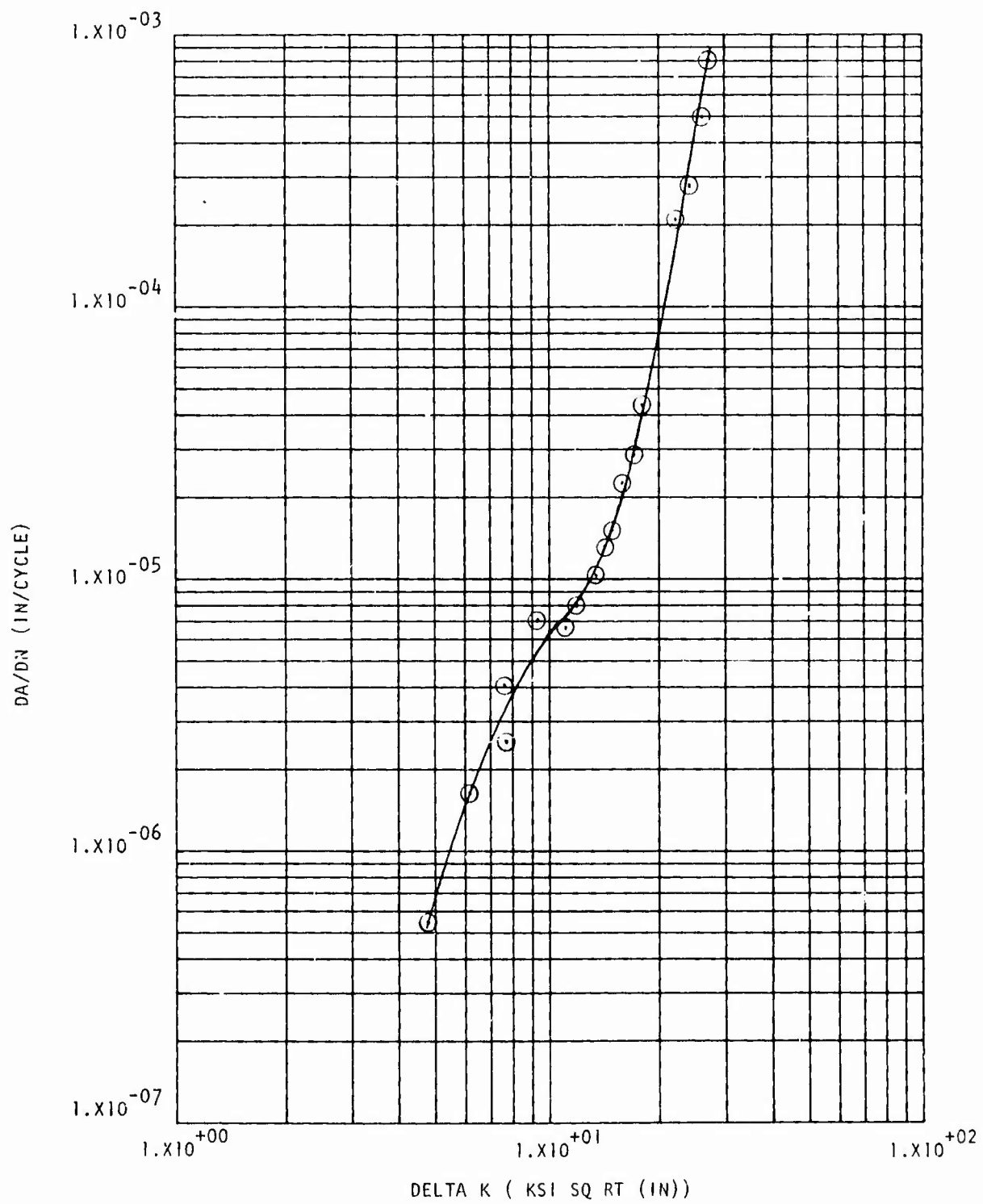
302 NRW 87-4 2024-T81 LHA RT R = 0.5 360 CPM



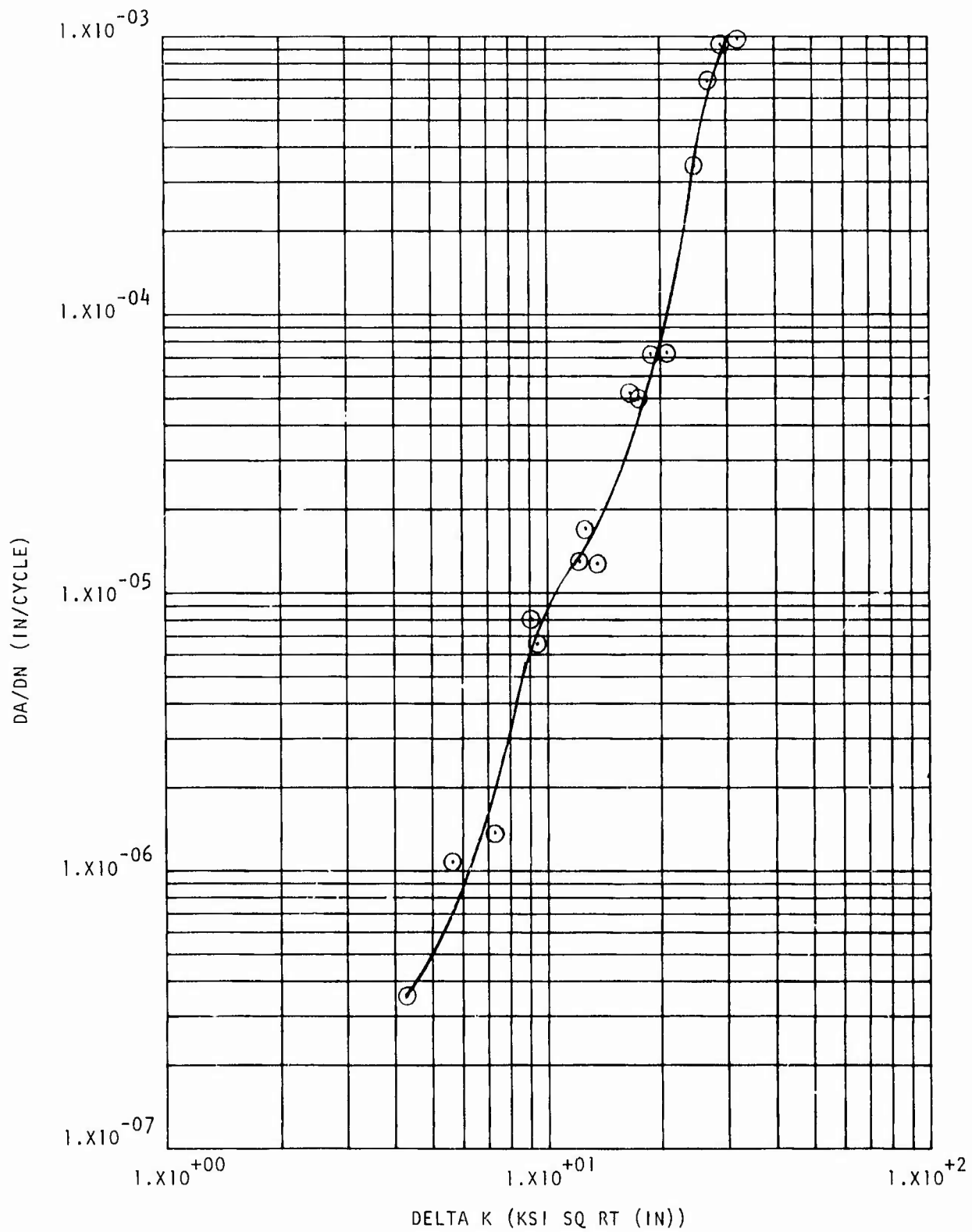
302 NRW 87-5 2024-T81 JP4 RT R = 0.08 60 CPM



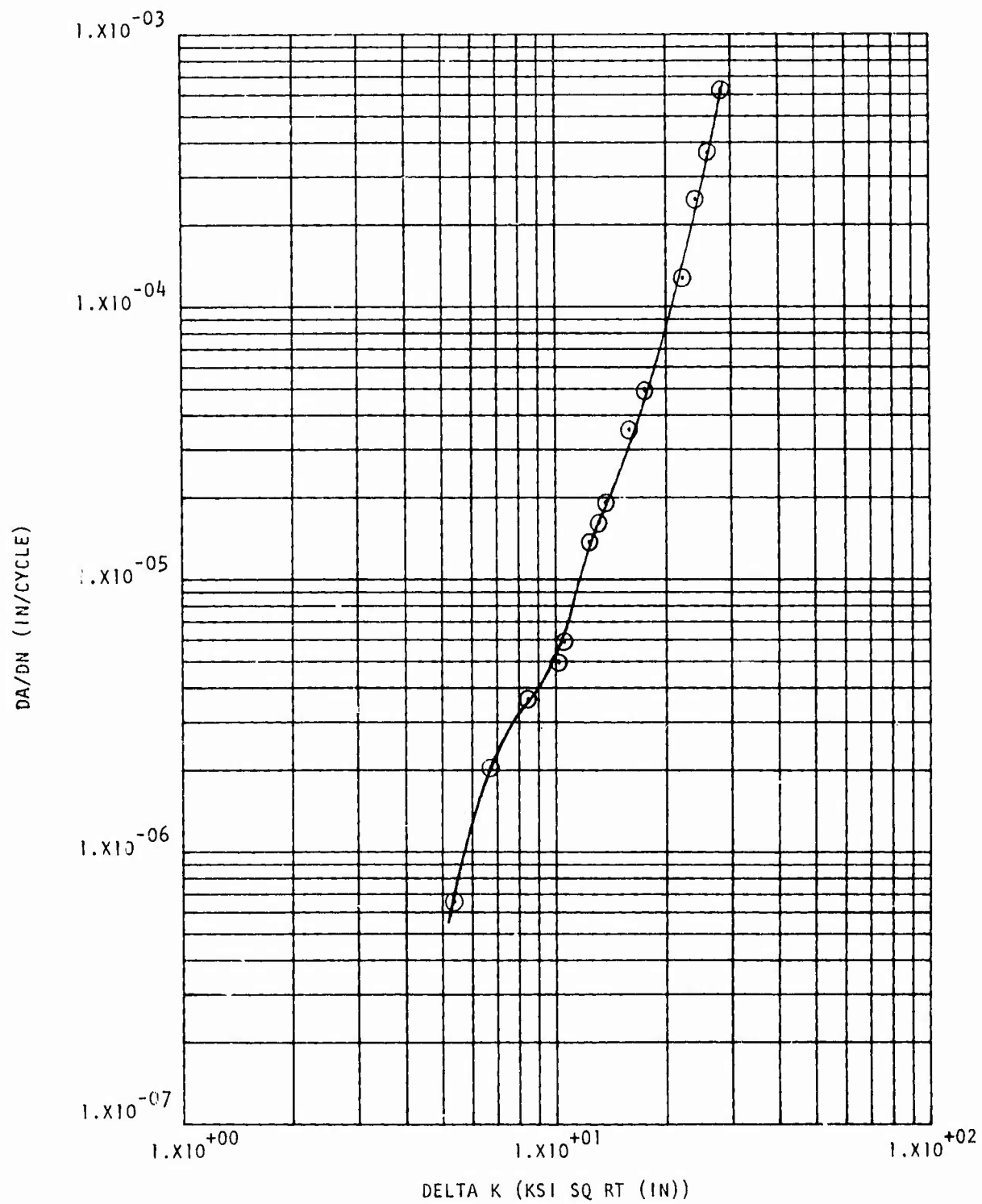
302 NRW 87-6 2024-T81 STW RT R = 0.08 60 CPM



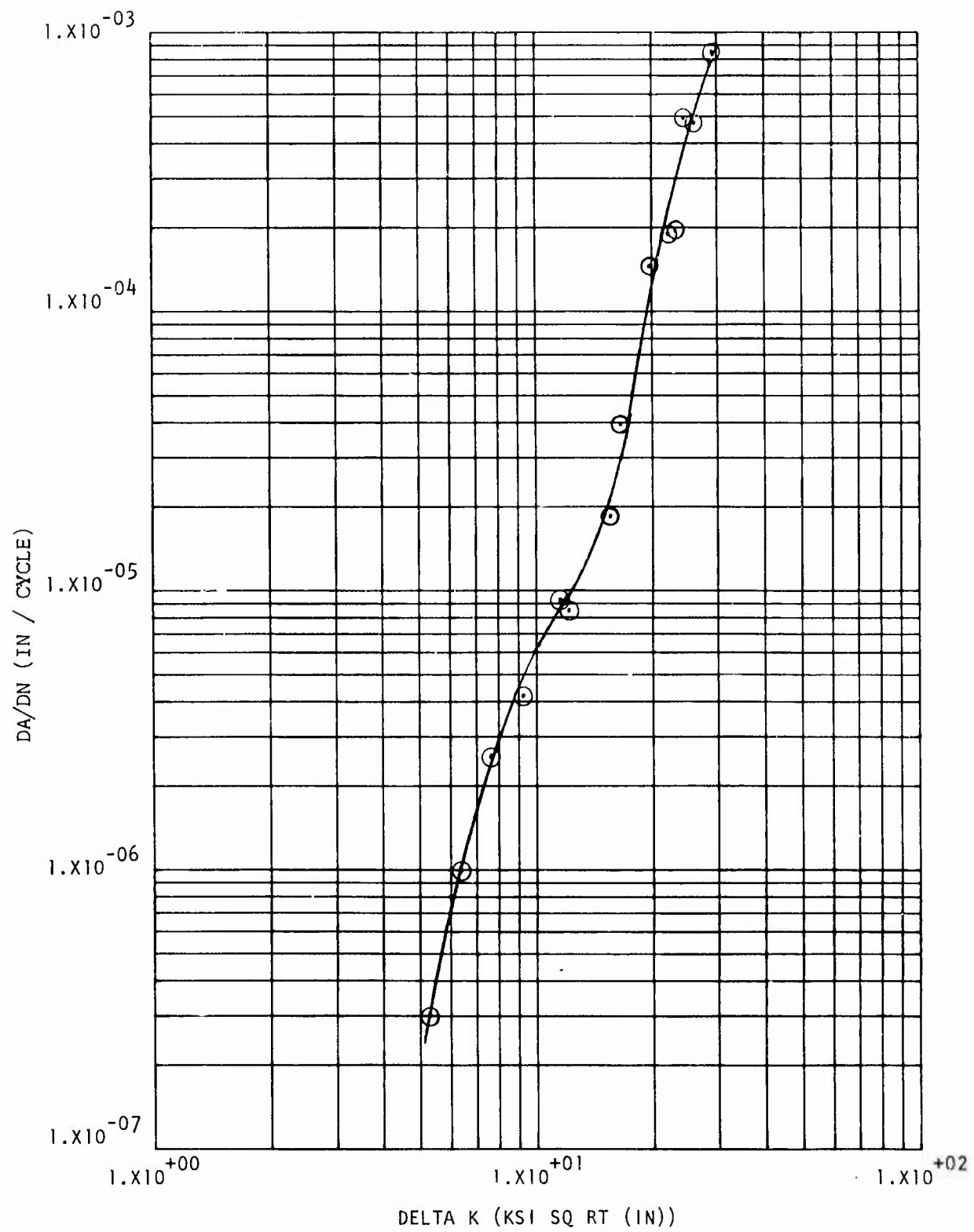
302 NWR 87-13 2024-T81 LHA RT R = 0.08 360 CPM



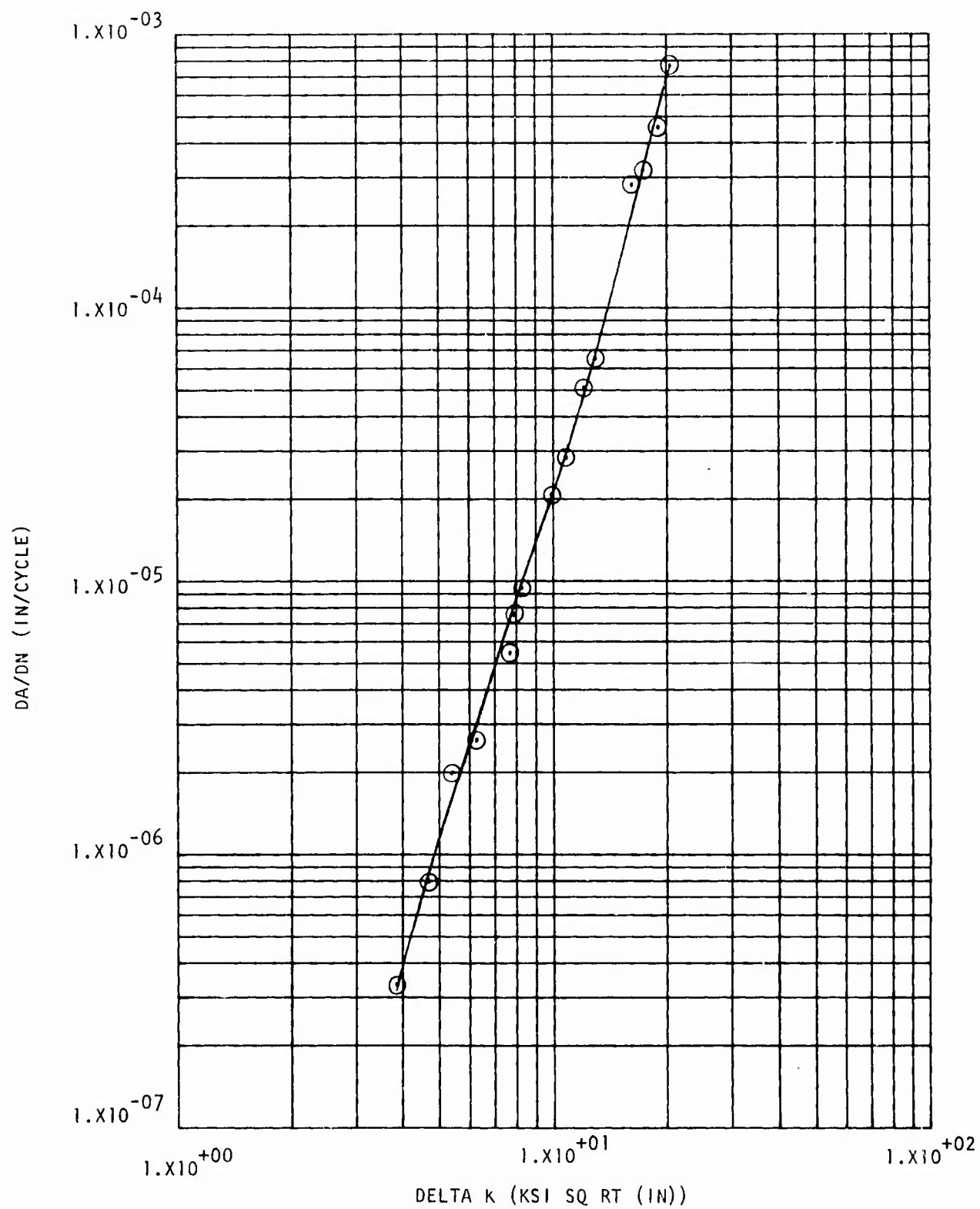
302 NWR 87-14 2024-T81 STW RT R = 0.08 60 CPM



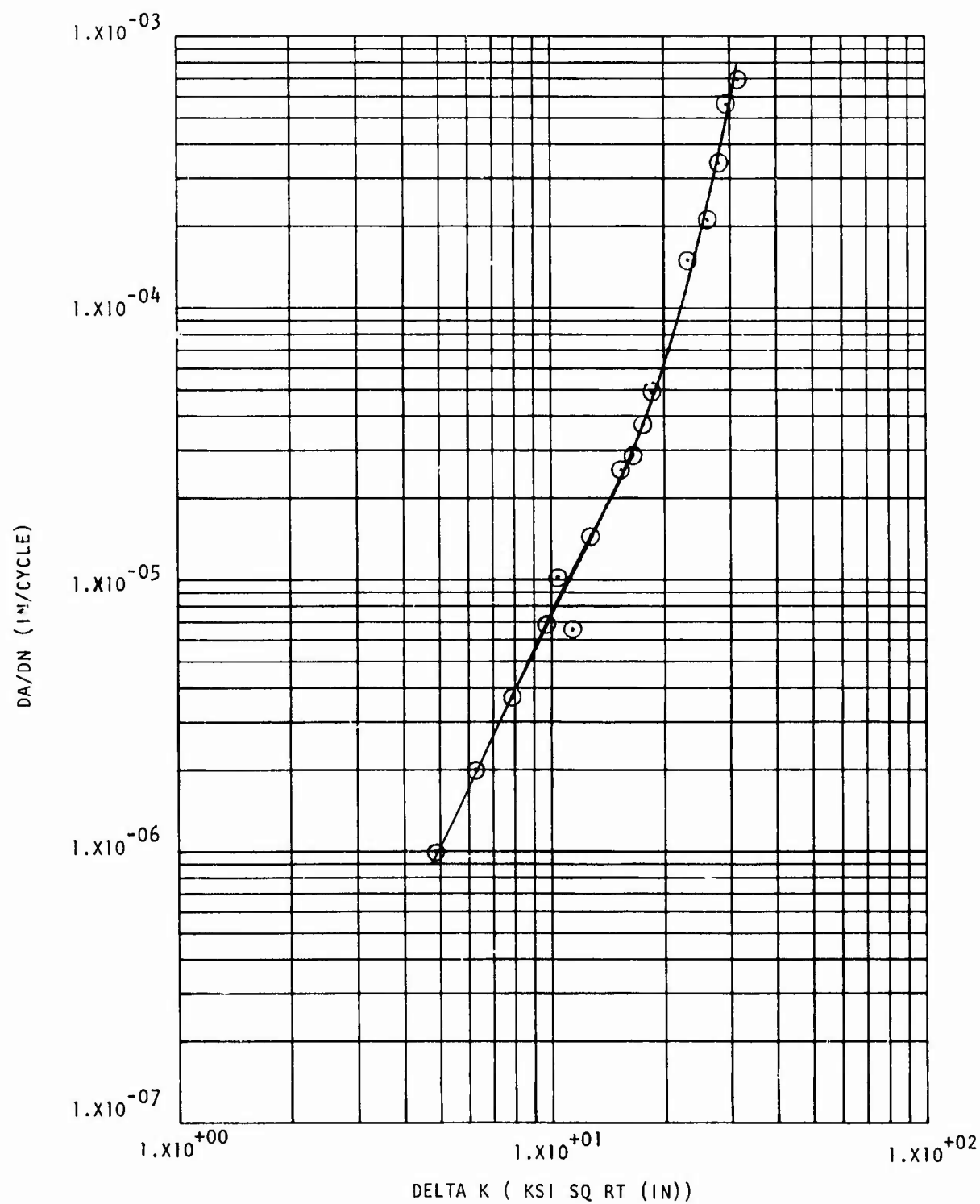
303 NRW 88-1 2024-T81 LHA RT R = 0.08 60 CPM



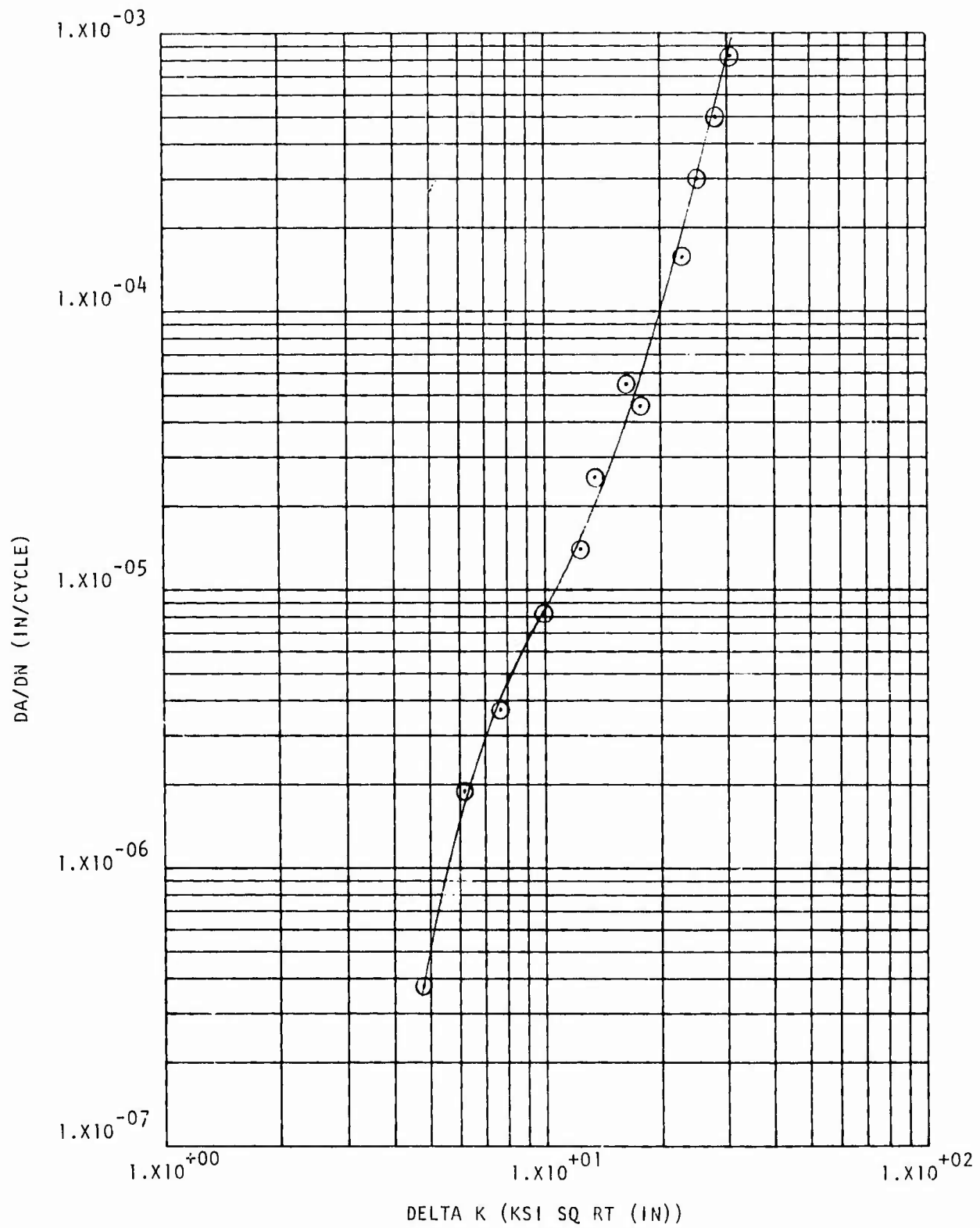
303 NRW 88-3 2024-T81 LHA PT R = 0.3 360 CPM



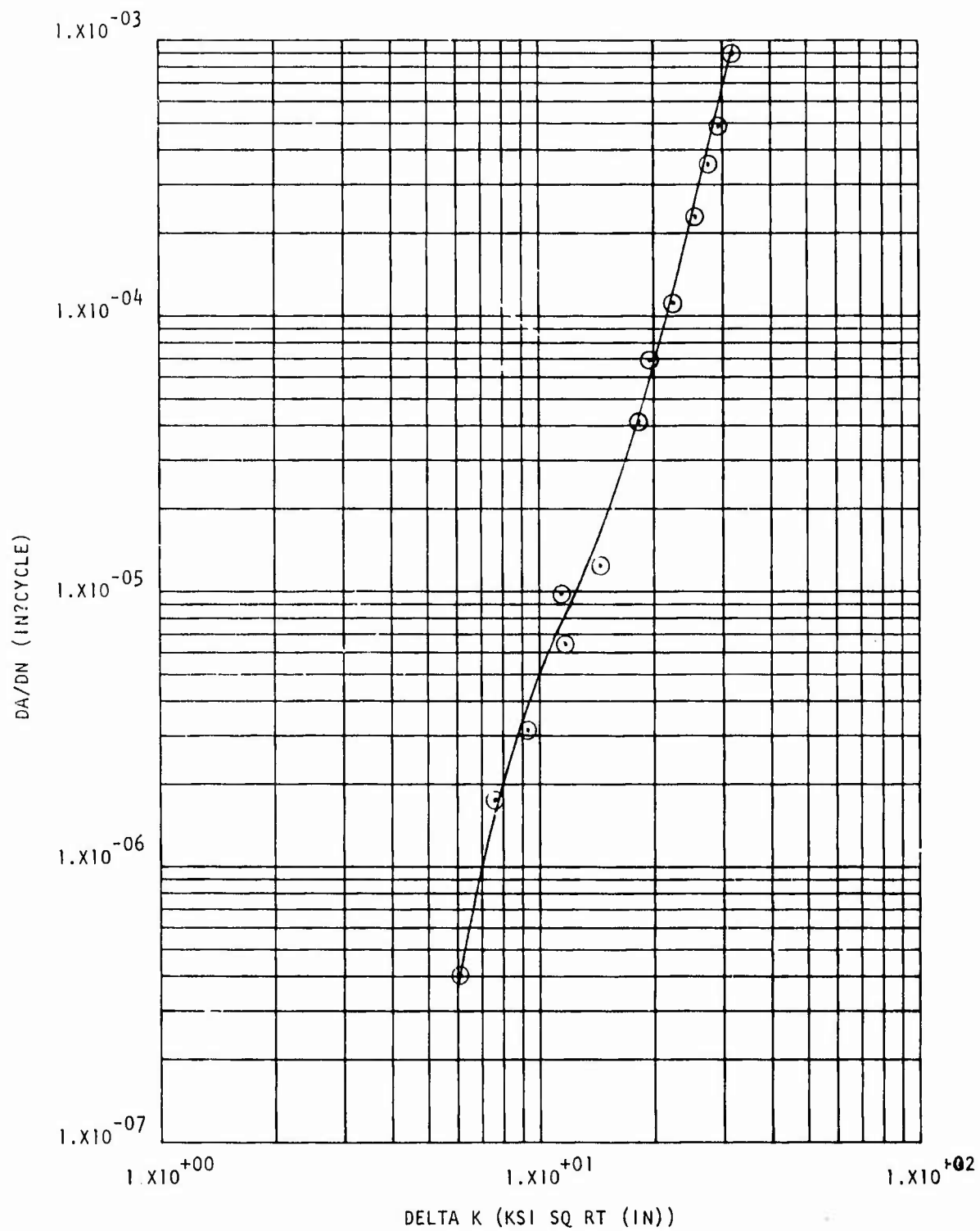
303 NRW 88-4 2024-T81 LHA RT R = 0.5 360 CPM



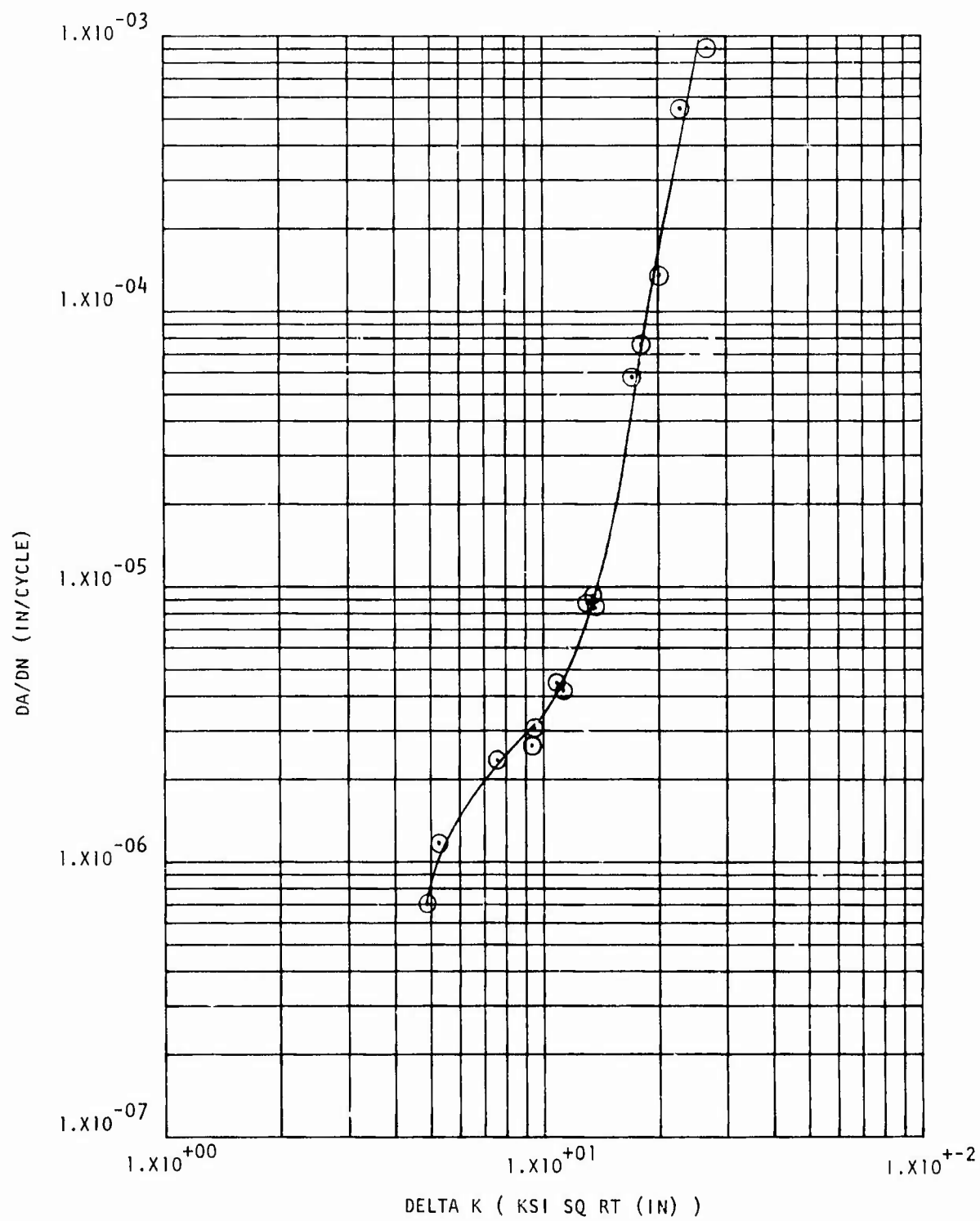
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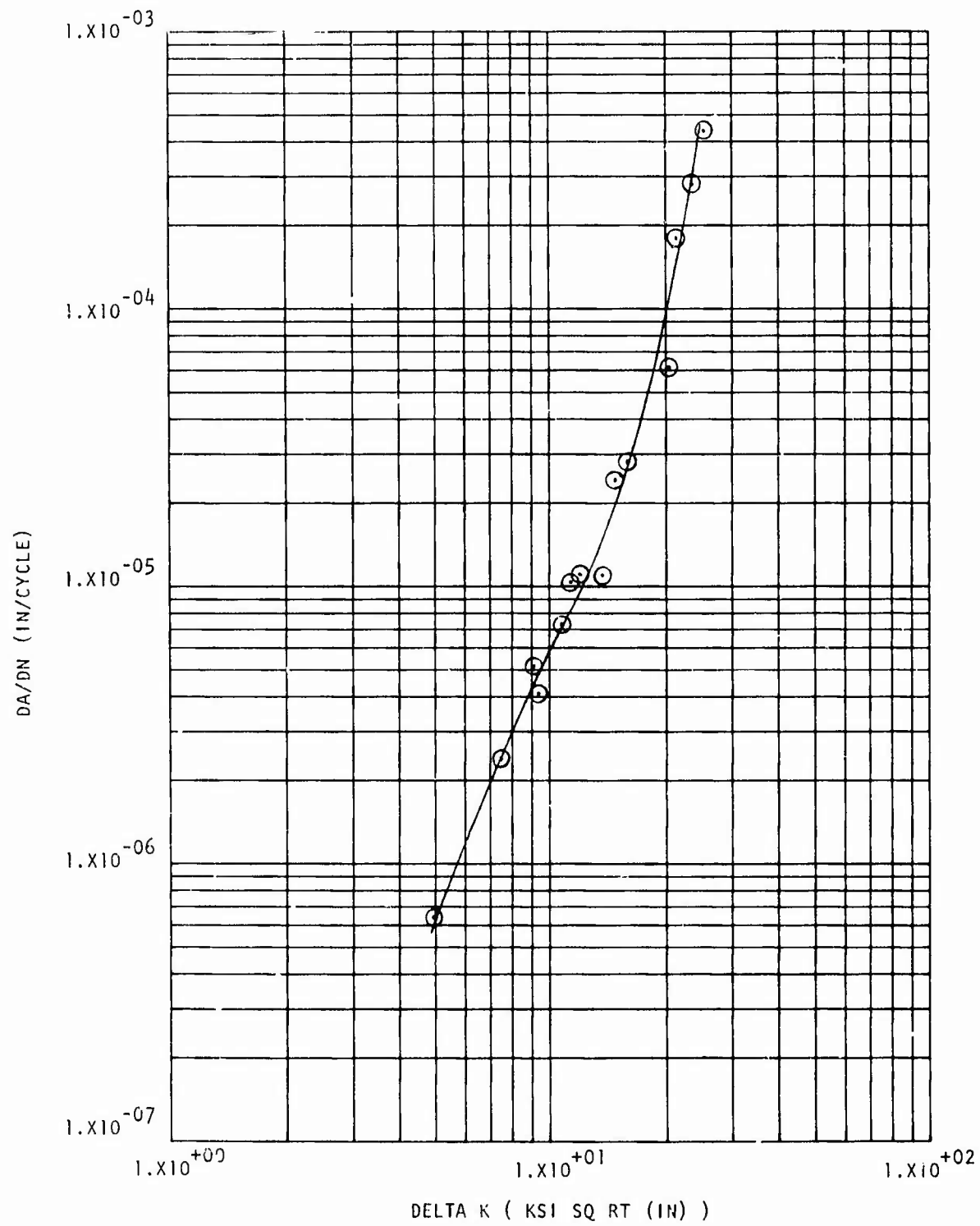
303 NRW 88-6 2021-T81 STW RT R = 0.08 60 CPM



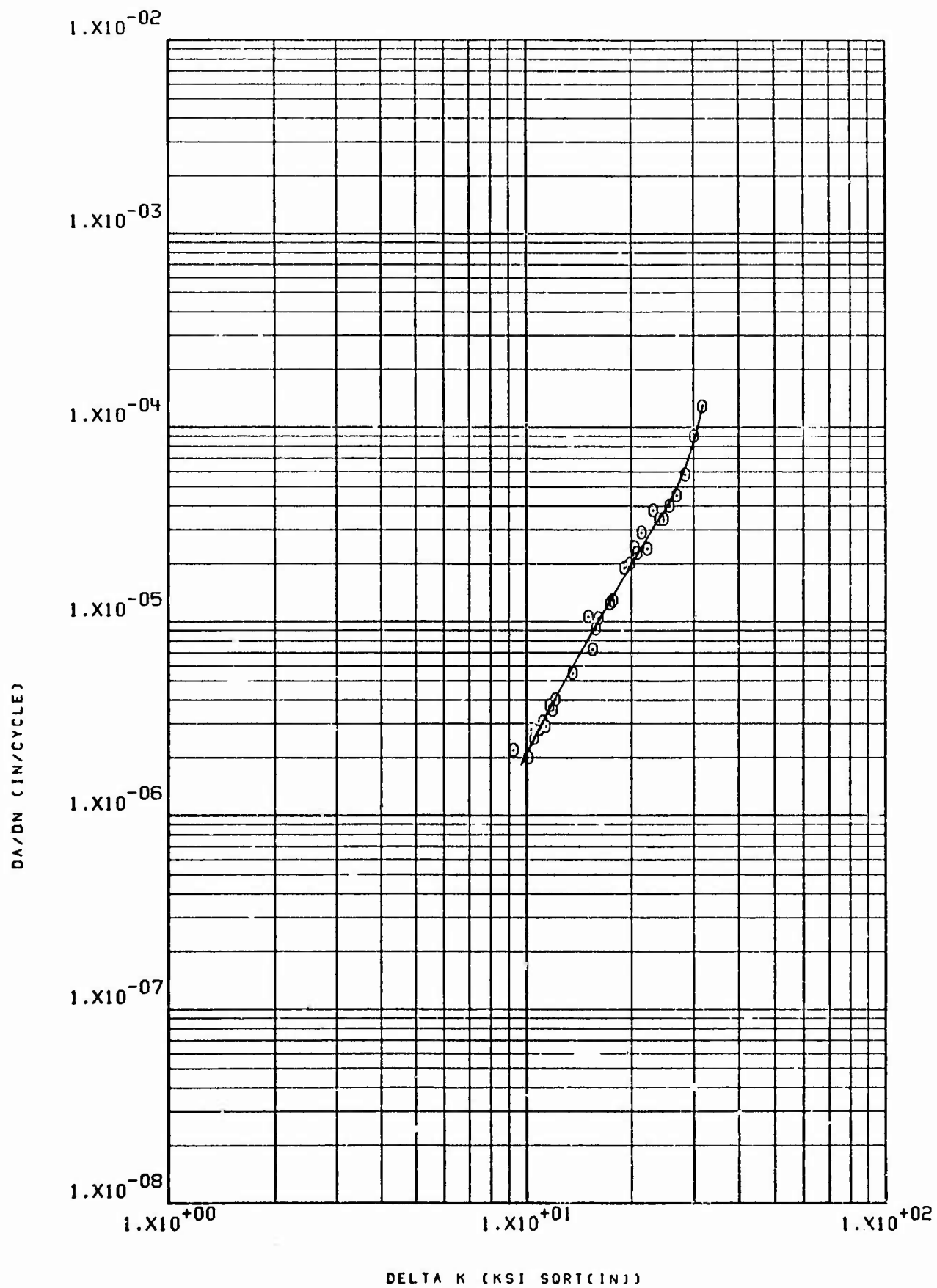
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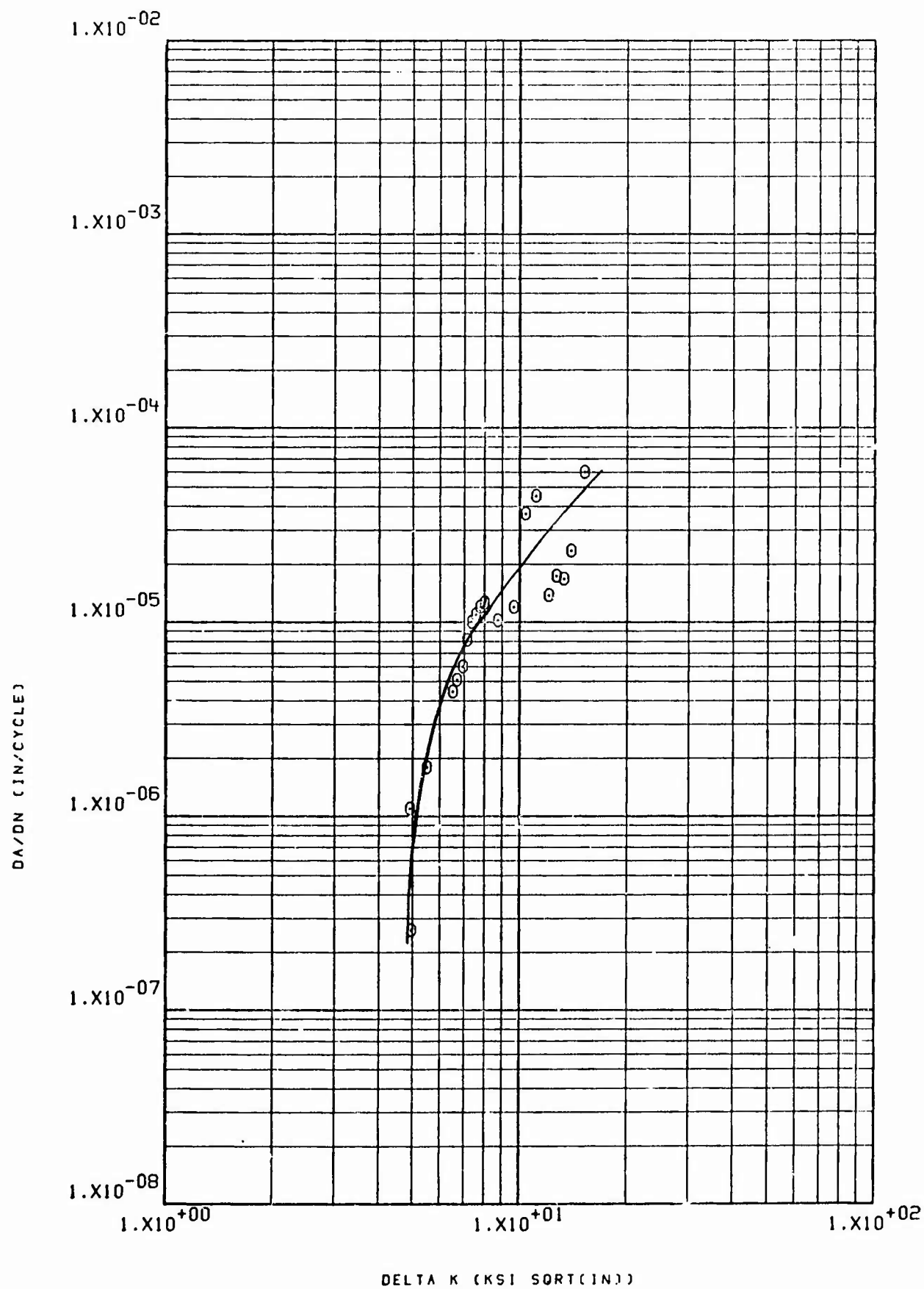


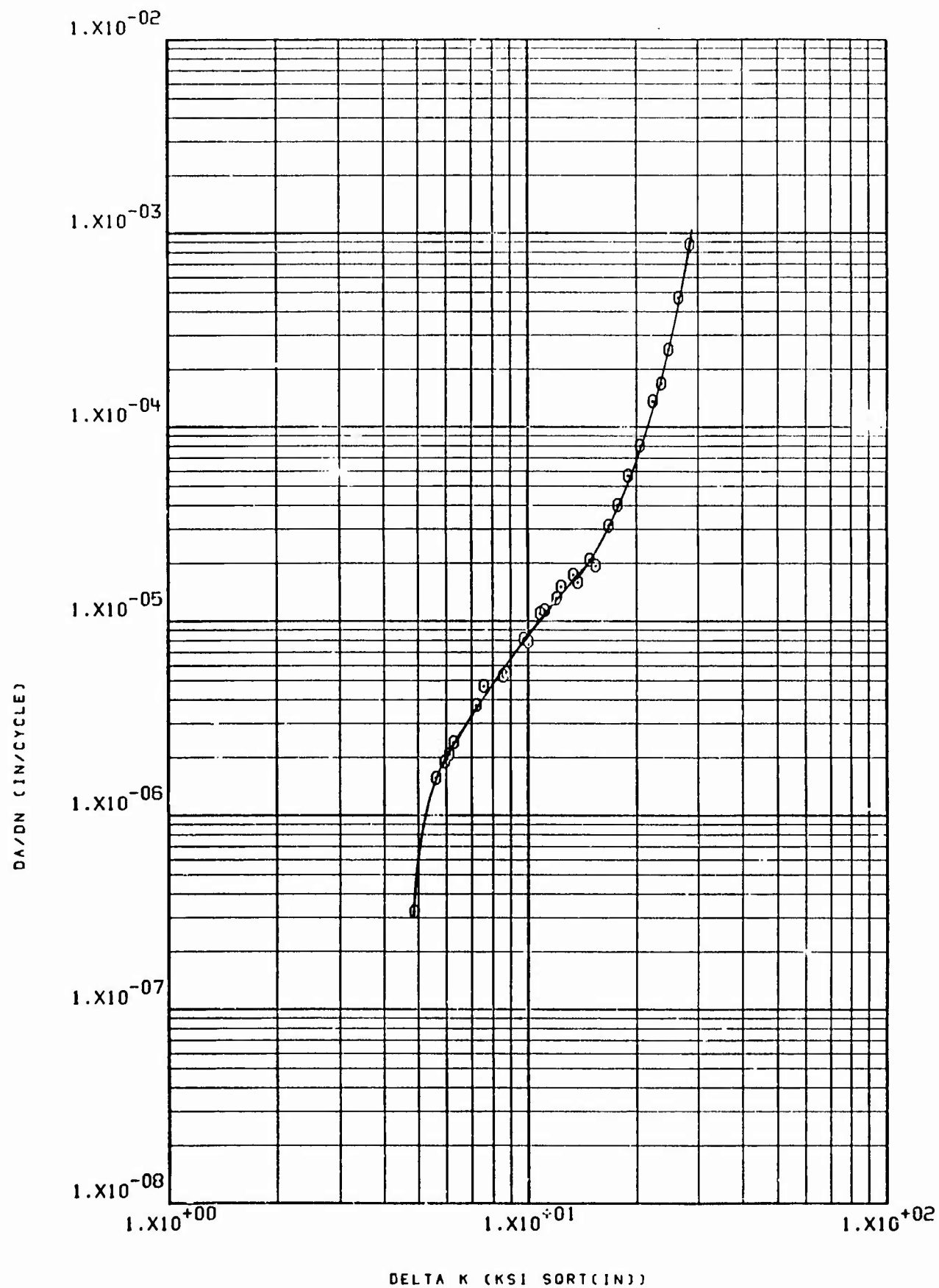
303 NWR 88-11 2024-T81 LHA RT R = 0.08 360 CPM

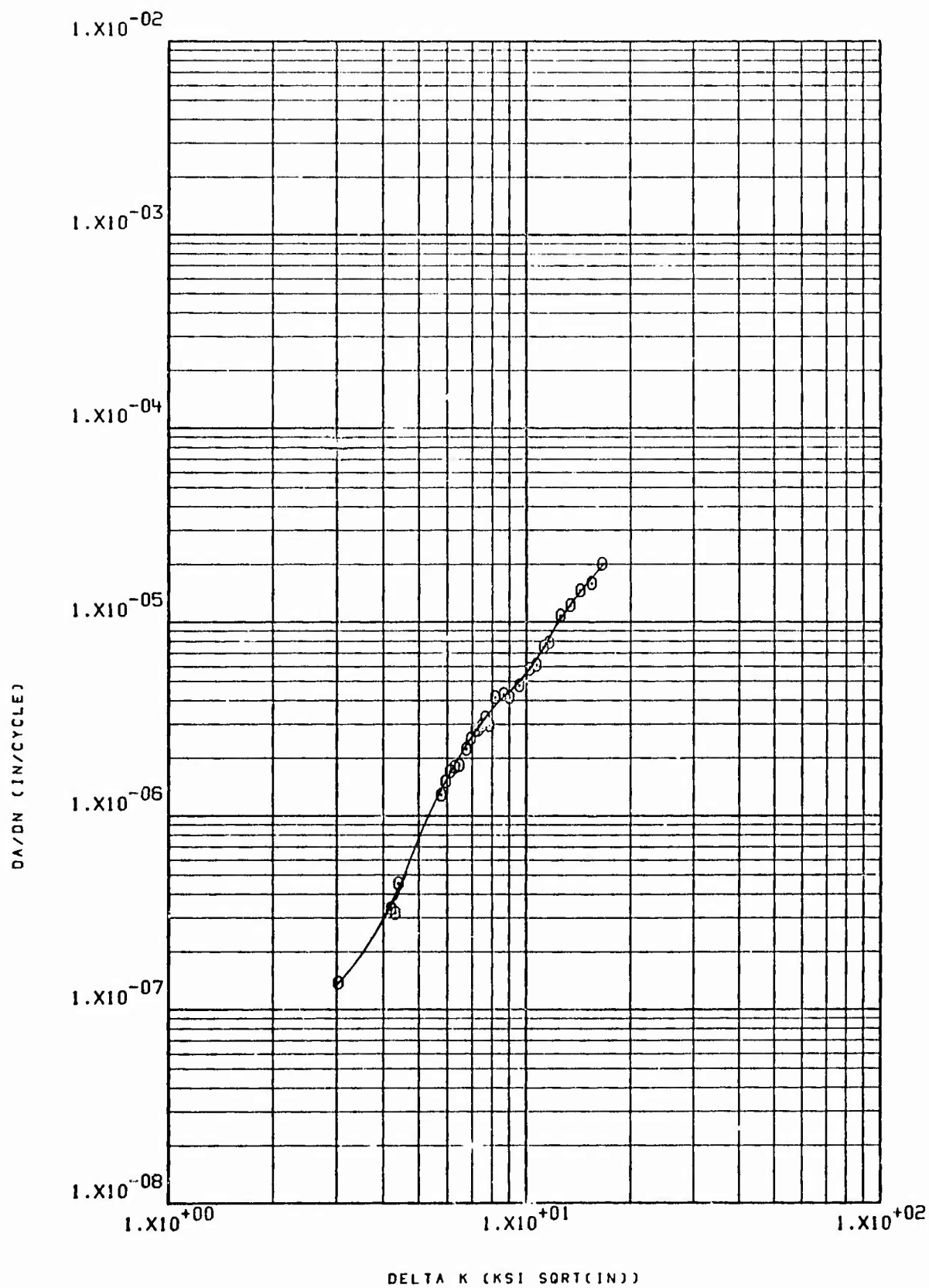


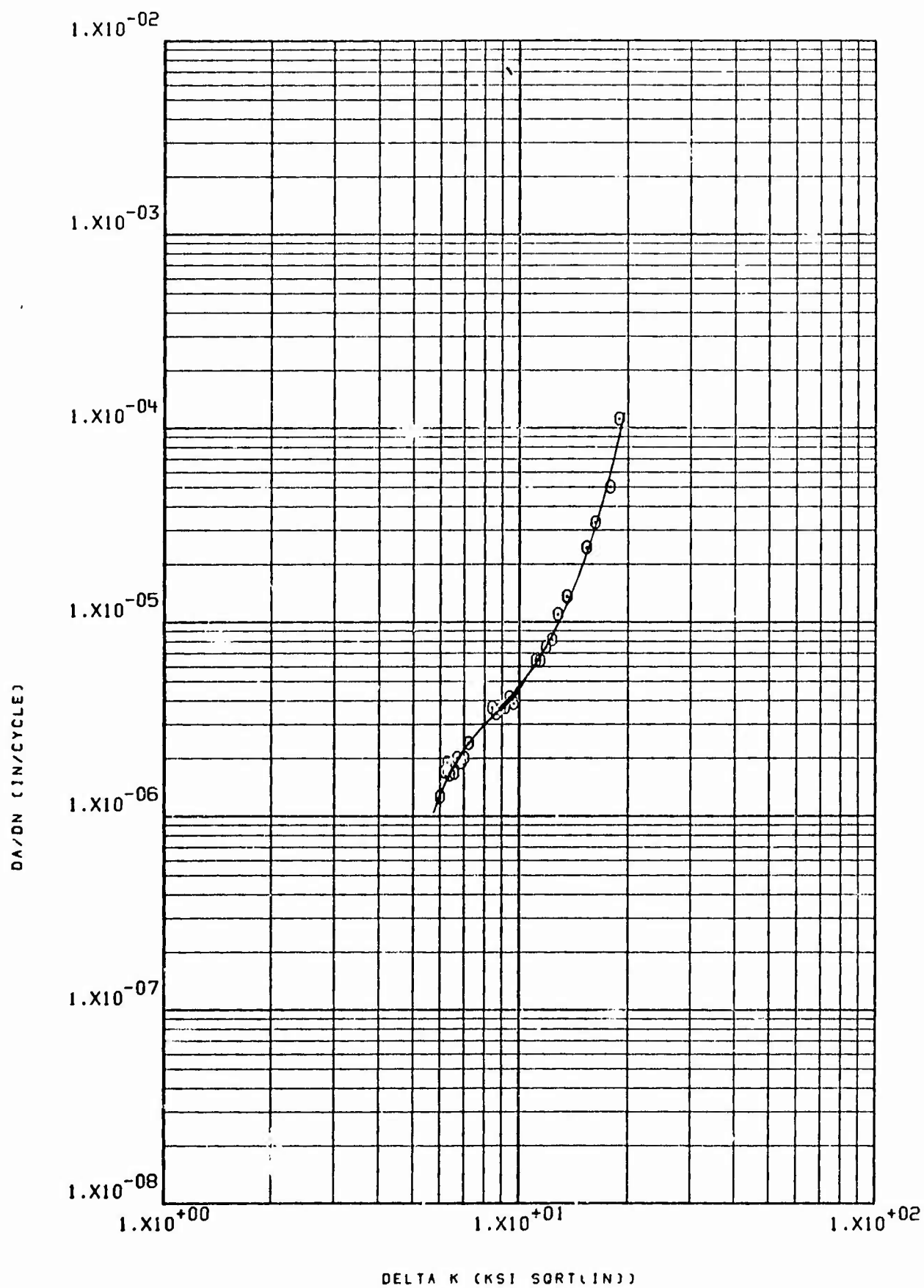
303 NWR 88-14 2024-T81 STW RT R = 0.08 60 CPM





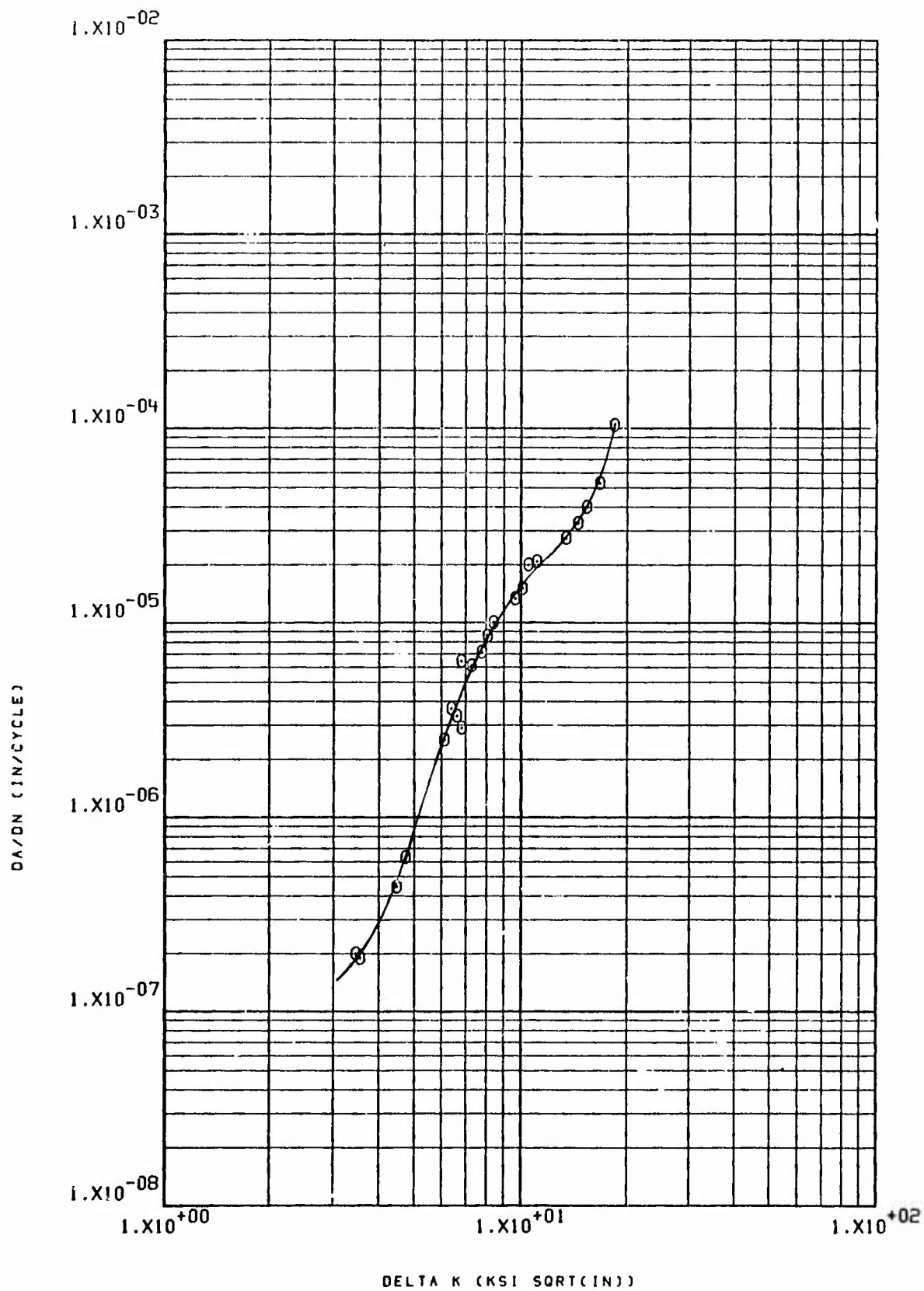






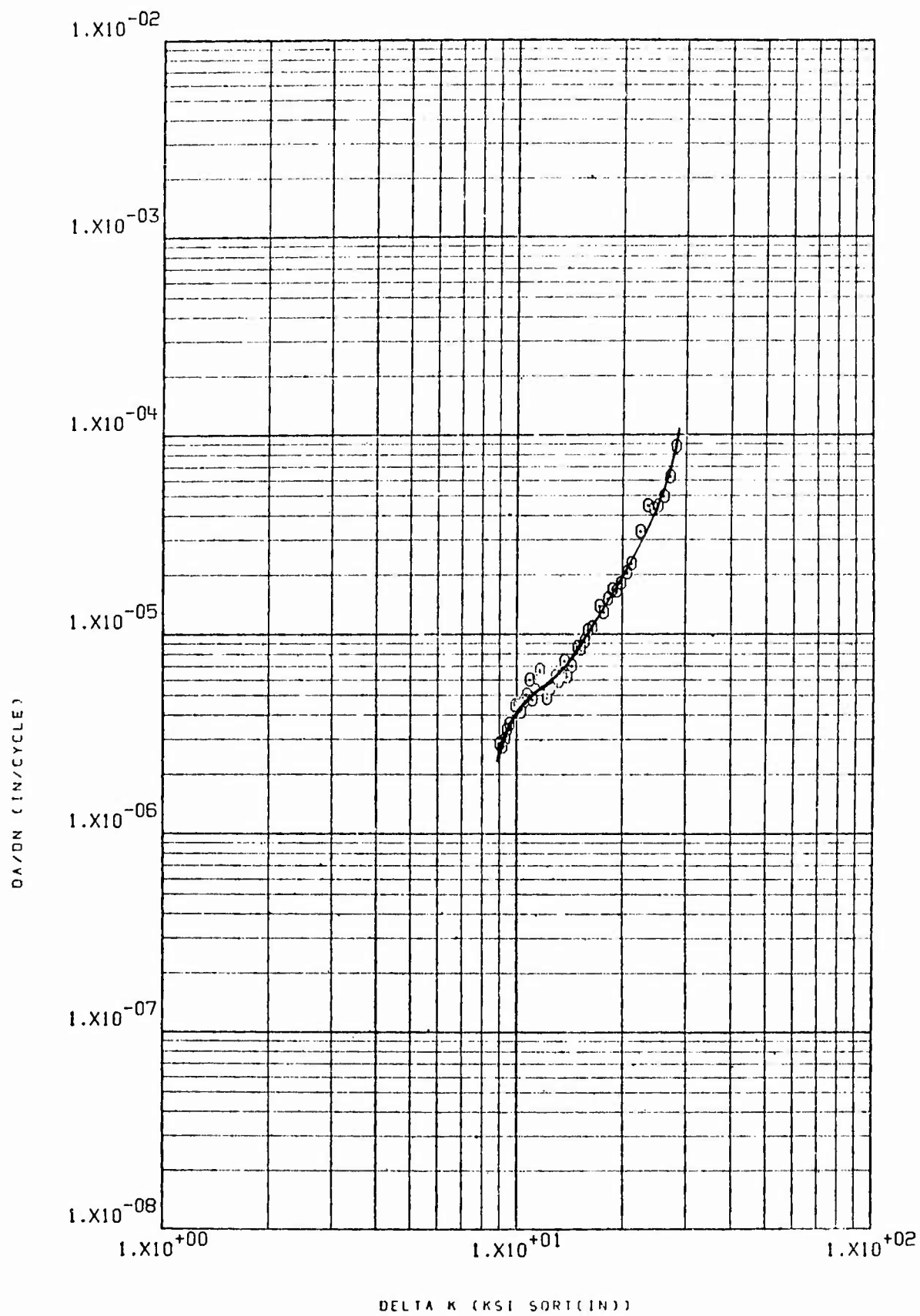
309 NWR 96-9 7075-176511 LHA RT R=.08 360CPM

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311 NWR 100-1 7075-173511 EXTRUSION SUMP RT R=.08 60CPH

B-212



314 NRW 110-1 2219-1851 OPY AIR RT R=.08 360 CPM

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

APPENDIX C

FATIGUE CRACK GROWTH RATE CURVES

FOR ALL STEEL AND INCONEL 718 TESTS

(EXCLUDING WELDMENTS)

APPENDIX - INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
HP-9-4-.30 H.T.	32 NRW 1-57	RW	5.0	0.6	1.0	LHA	R.T.	0.08	60	C-1
"	32 NRW 1-60	RW	5.0	0.6	1.0	STW	R.T.	0.08	60	C-2
"	32 NRW 1-61	RW	5.0	0.6	1.0	LHA	R.T.	0.3	360	C-3
"	32 NRW 1-63	WR	5.0	0.6	1.0	LHA	R.T.	0.08	360	C-4
"	32 NRW 2-58	RW	5.0	0.6	1.0	LHA	R.T.	0.08	360	C-5
EP-9-4.20 H.T.	33 NRW 14-2	WR	6.0	0.6	1.0	LHA	-65	0.08	60	C-6
"	33 NRW 14-6	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	C-7
"	33 NRW 14-8	RW	6.0	0.6	1.0	LHA	R.T.	0.08	60	C-8
"	33 NRW 15-3	RW	6.0	0.6	1.0	100% HUM	R.T.	0.08	60	C-9
"	33 NRW 15-6	RW	6.0	0.6	1.0	LHA	R.T.	0.5	360	C-10
"	33 NRW 15-11	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	C-11
"	33 NRW 15-12	RW	6.0	0.6	1.0	LHA	-65	0.08	60	C-12
"	33 NRW 15-26	RW	7.4	0.486	1.0	100% HUM	R.T.	0.5	60	C-13
"	33 NRW 15-27	RW	7.4	0.486	1.0	100% HUM	R.T.	0.3	60	C-14
"	33 NRW 15-28	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-15
"	33 NRW 66	WR	5.8	0.619	1.0	LHA	R.T.	0.05	60	C-16
"	33 NRW 67	RW	6.0	0.6	1.0	LHA	R.T.	0.05	60	C-17
HP-9-4.30 H.T.	35 NRW 20-1	RW	7.4	0.486	1.0	STW	R.T.	0.08	6	C-18
"	35 NRW 20-3	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	C-19
"	35 NRW 20-4	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	C-20
"	35 NRW 20-6	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	C-21
"	35 NRW 20-7	RW	7.4	0.486	1.0	LHA	-65	0.08	360	C-22
"	35 NRW 20-8	WR	7.4	0.486	0.75	STW	R.T.	0.08	60	C-23
"	35 NRW 20-9	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	C-24
"	35 NRW 20-10	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	C-25
"	35 NRW 20-11	RW	7.4	0.486	0.75	STW	R.T.	0.5	60	C-26
"	35 NRW 20-12	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-27
"	35 NRW 20-13	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	C-28
"	35 NRW 20-14	RW	7.4	0.486	0.75	STW	R.T.	0.08	6	C-29
"	35 NRW 20-15	RW	7.4	0.486	1.0	LHA	R.T.	0.08	6	C-30
"	35 NRW 20-16	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	C-31
"	35 NRW 20-18	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-32

Note: All figures on this page are for CT specimens

APPENDJ : INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
PH 13-8Mo H1000	36 NRW 24-1	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	C-33
"	36 NRW 24-2	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	C-34
"	36 NRW 24-3	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	C-35
"	36 NRW 24-4	RW	6.0	0.6	1.0	LHA	R.T.	0.5	360	C-36
"	36 NRW 24-5	RW	6.0	0.6	1.0	STW	R.T.	0.3	60	C-37
"	36 NRW 24-8	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	C-38
HP-9-4 .20 H.T.	37 NRW 30-2	RW	7.4	0.486	0.850	100% HUM	R.T.	0.08	6	C-39
"	37 NRW 30-3	RW	6.0	0.6	0.825	LHA	R.T.	0.08	360	C-40
"	37 NRW 30-4	RW	7.4	0.486	1.0	STW	R.T.	0.08	6	C-41
"	37 NRW 30-7	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-42
"	37 NRW 30-8	RW	7.4	0.486	1.0	LHA	-65	0.08	60	C-43
"	37 NRW 30-9	RW	7.4	0.486	1.0	100% HUM	R.T.	0.08	60	C-44
"	37 NRW 30-12	RW	7.4	0.486	1.0	Dist. H ₂ O	R.T.	0.08	6	C-45
"	37 NRW 30-13	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-46
"	37 NRW 30-14	WR	7.4	0.486	1.0	LHA	R.T.	0.08	60	C-47
"	37 NRW 30-15	WR	6.0	0.6	1.0	LHA	-65	0.08	60	C-48
"	37 NRW 31-1	WR	7.4	0.486	1.0	LHA	-65	0.08	60	C-49
"	37 NRW 31-2	WR	7.4	0.486	1.0	LHA	R.T.	0.08	60	C-50
"	37 NRW 31-5	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-51
"	37 NRW 31-6	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	C-52
"	37 NRW 31-7	RW	7.4	0.486	1.0	LHA	-65	0.08	60	C-53
300M	39 NRW 55-7	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-54
"	39 NRW 55-8	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	C-55
"	39 NRW 55-9	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	C-56
"	39 NRW 55-10	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	C-57
"	39 NRW 55-11	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	C-58
"	39 NRW 55-12	RW	7.4	0.486	1.0	LHA	-65	0.08	360	C-59
"	39 NRW 55-13	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	C-60
"	39 NRW 55-14	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	C-61
"	39 NRW 55-16	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	C-62
"	39 NRW 55-17	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-63
"	39 NRW 55-18	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	C-64

Note: All figures on this page are for CT specimens.

API JIX C: INDEX OF FIGURES

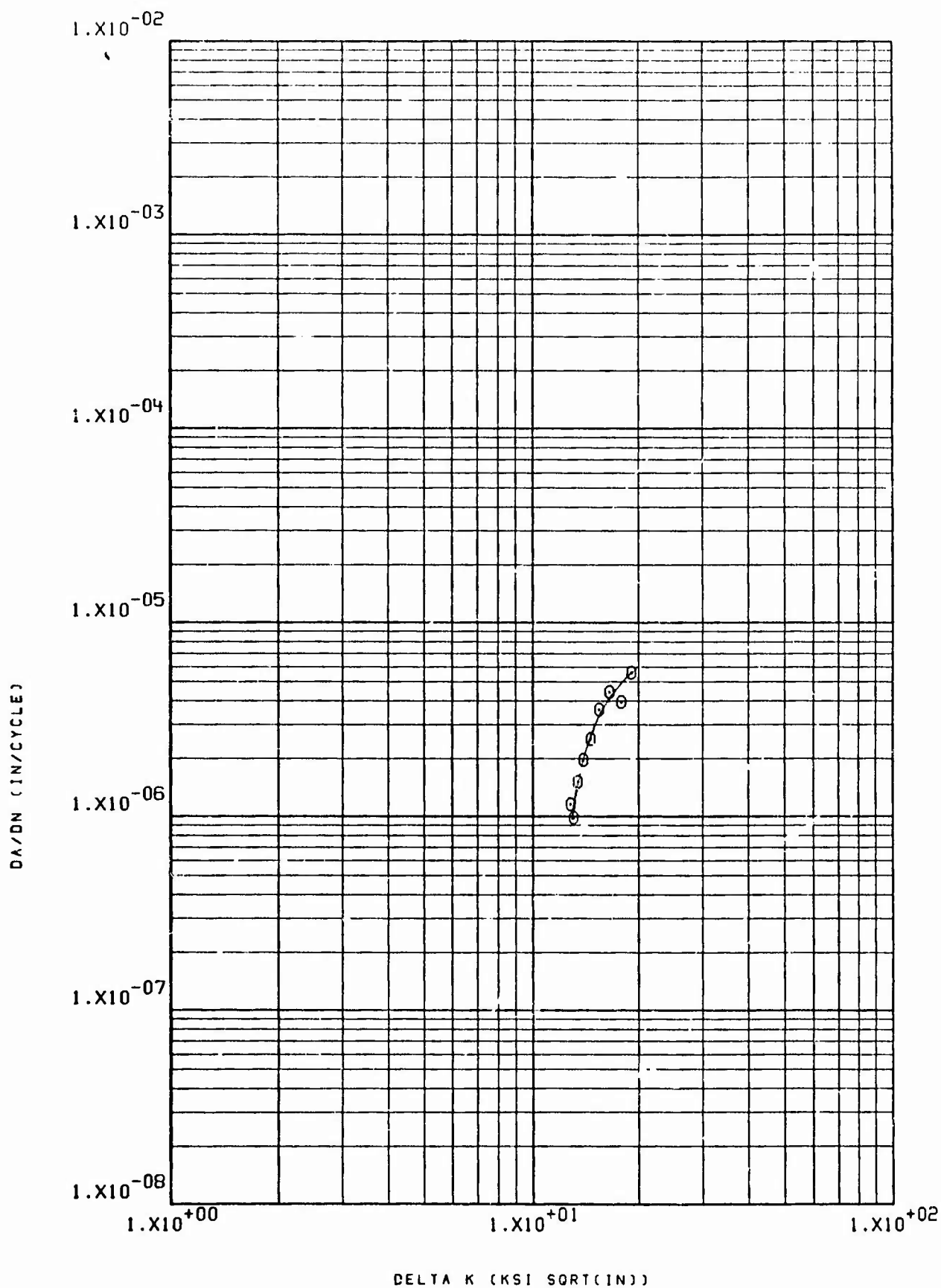
Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"E"	Freq (CPM)	Page No.
300M	H.T.	TR	3.09	0.471	1.0	STW	R.T.	0.08	60	C-65
"	"	TR	3.09	0.471	1.0	LHA	-65	0.08	360	C-66
"	"	TR	3.09	0.471	1.0	LHA	R.T.	0.08	360	C-67
"	"	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	C-68
"	"	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	C-69
"	"	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	C-70
PHL3-8Mo	H1000	WR	7.4	0.486	0.5	LHA	R.T.	0.08	360	C-71
"	"	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	C-72
"	"	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-73
"	"	WR	7.4	0.486	1.0	LHA	-65	0.08	360	C-74
"	"	RW	7.4	0.486	1.0	LHA	R.T.	0.08	6	C-75
"	"	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	C-76
"	"	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-77
"	"	RW	7.4	0.486	1.0	LHA	-65	0.08	360	C-78
"	"	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	C-79
"	"	RW	7.4	0.486	1.0	STW	R.T.	0.08	6	C-80
"	"	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	C-81
"	"	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	C-82
"	"	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	C-83
"	"	RW	7.4	0.486	0.25	LHA	R.T.	0.08	360	C-84
"	"	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	C-85
"	"	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	C-86
"	"	RW	7.4	0.486	1.0	SGS	R.T.	0.08	60	C-87
PHL3-8Mo	H1000	RW	6.0	0.6	1.0	LHA	-65	0.08	360	C-88
"	"	RW	6.175	0.486	1.0	LHA	R.T.	0.08	360	C-89
"	"	RW	6.175	0.486	1.0	LHA	R.T.	0.5	360	C-90
"	"	RW	6.175	0.486	1.0	LHA	R.T.	0.08	360	C-91
"	"	RW	6.175	0.486	1.0	LHA	R.T.	0.5	360	C-92
"	"	RW	6.175	0.486	1.0	STW	R.T.	0.08	60	C-93
"	"	RW	6.175	0.486	1.0	LHA	R.T.	0.08	360	C-94
"	"	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-95
"	"	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-96

NOTE: All figures on this page are for OT Specimens.

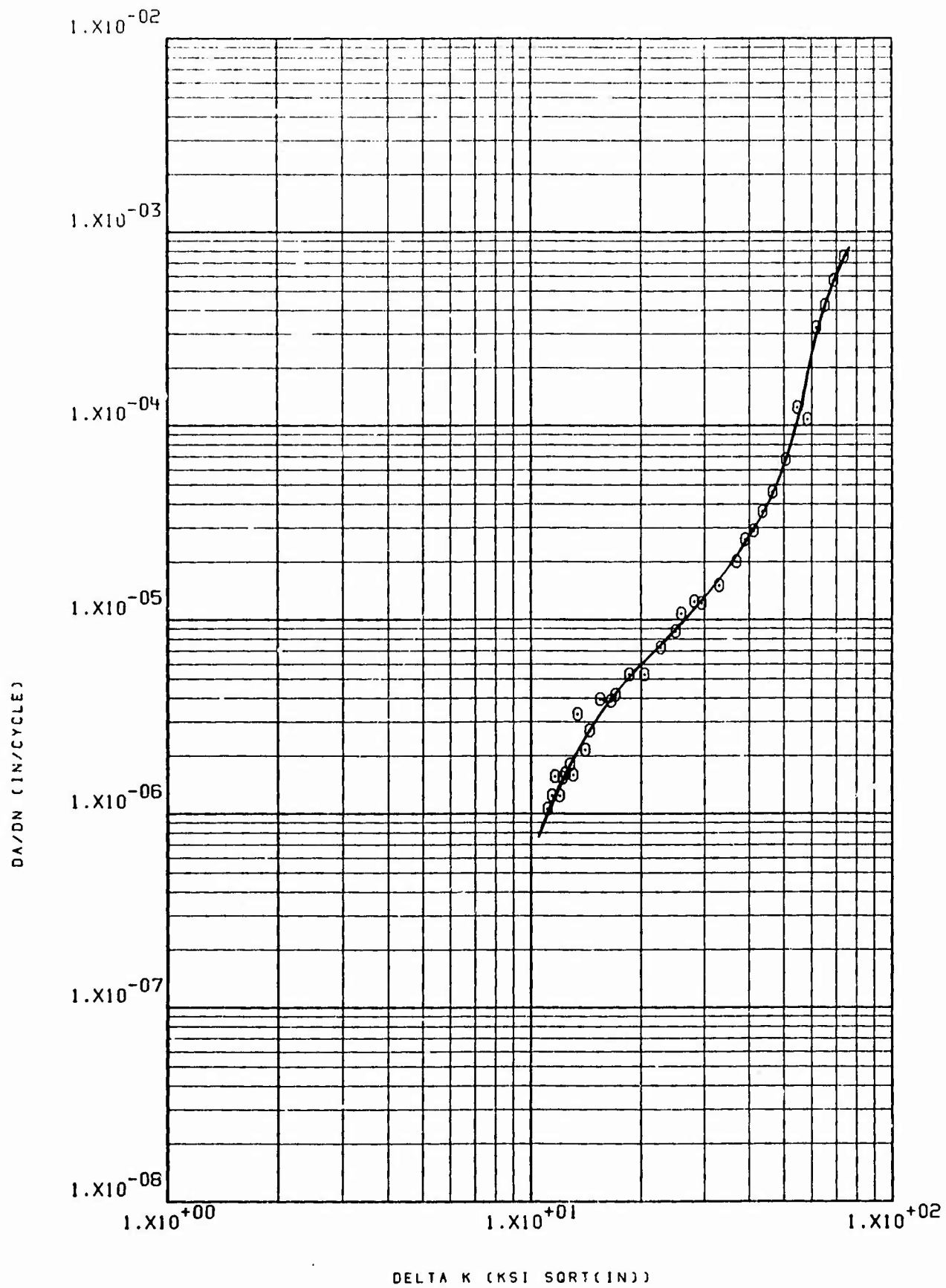
APPENDIX C - INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environ-ment	Test Temp	"R"	Freq (CPM)	Page No.
HP-9-4-.20 H.T.	43 NWR 60-1	WR	6.0	0.6	0.5	LHA	R.T.	0.08	360	C-97
"	43 NWR 60-3	RW	6.0	0.6	1.0	LHA	R.T.	0.08	60	C-98
"	43 NWR 60-5	RW	6.0	0.6	1.0	LHA	R.T.	0.08	540	C-99
"	43 NWR 60-7	RW	6.0	0.6	1.0	LHA	R.T.	0.7	360	C-100
"	43 NWR 60-51	RW	6.0	0.6	1.0	SCS	R.T.	0.08	60	C-101
"	43 NWR 60-53	RW	6.0	0.6	1.0	100% HUM.	R.T.	0.08	6	C-102
"	43 NWR 60-55	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	C-103
"	43 NWR 60-57	RW	6.0	0.6	1.0	LHA	R.T.	0.08	6	C-104
"	43 NWR 60-59	RW	6.0	0.6	0.5	LHA	R.T.	0.08	360	C-105
"	43 NWR 60-61	RW	6.0	0.6	0.25	LHA	R.T.	0.08	360	C-106
PHL3-8Mo H1000	44 NWR 62-8	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	C-107
"	44 NWR 62-9	WR	5.0	0.486	1.0	LHA	R.T.	0.08	360	C-108
"	44 NWR 62-10	WR	5.0	0.486	1.0	LHA	-65	0.08	360	C-109
HP-9-4-.20 H.T. (VIM/VAR)	46 NWR 73-7	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	C-110
"	46 NWR 73-8	RW	6.0	0.6	1.0	100% HUM.	R.T.	0.08	60	C-111
"	46 NWR 73-9	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	C-112
INCO 718 H.T.	51 NTR 82-19	TR	3.77	0.477	1.0	LHA	400	0.08	360	C-113
"	51 NTR 82-20	TR	3.77	0.477	1.0	LHA	R.T.	0.08	360	C-114
"	51 NTR 82-21	TR	3.77	0.477	1.0	STW	R.T.	0.08	60	C-115
"	51 NTR 82-50	WR	7.4	0.486	0.5	LHA	R.T.	0.08	360	C-116
"	51 NTR 82-51	WR	7.4	0.486	0.5	STW	R.T.	0.08	60	C-117
"	51 NTR 82-52	WR	7.4	0.486	0.5	SCS	R.T.	0.08	60	C-118
"	51 NTR 82-53	RW	6.0	0.6	0.5	LHA	400	0.08	360	C-119
"	51 NTR 82-54	RW	6.0	0.6	0.5	LHA	400	0.5	360	C-120
"	51 NTR 82-55	RW	6.0	0.6	0.5	LHA	R.T.	0.08	360	C-121
"	51 NTR 82-56	RW	6.0	0.6	0.5	STW	R.T.	0.08	60	C-122
"	51 NTR 82-57	RW	6.0	0.6	0.5	LHA	R.T.	0.5	360	C-123
INCO 718 H.T.	53 NWR 98-1	WR	6.0	0.6	0.5	LHA	R.T.	0.08	360	C-124
"	53 NWR 98-2	RW	7.4	0.486	0.5	LHA	R.T.	0.5	360	C-125
"	53 NWR 98-3	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	C-126

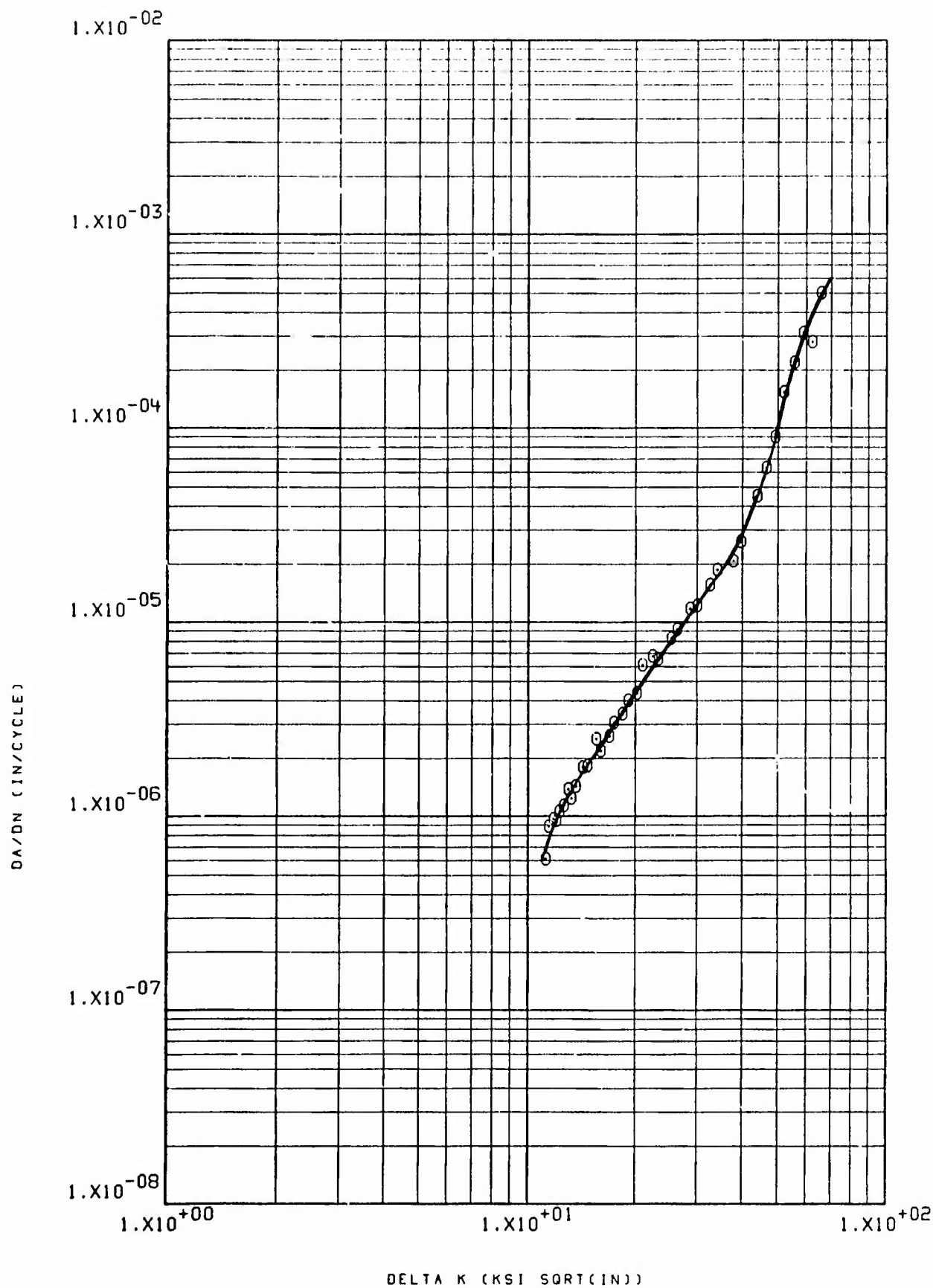
Note: All figures on this page are for compact tension specimens.

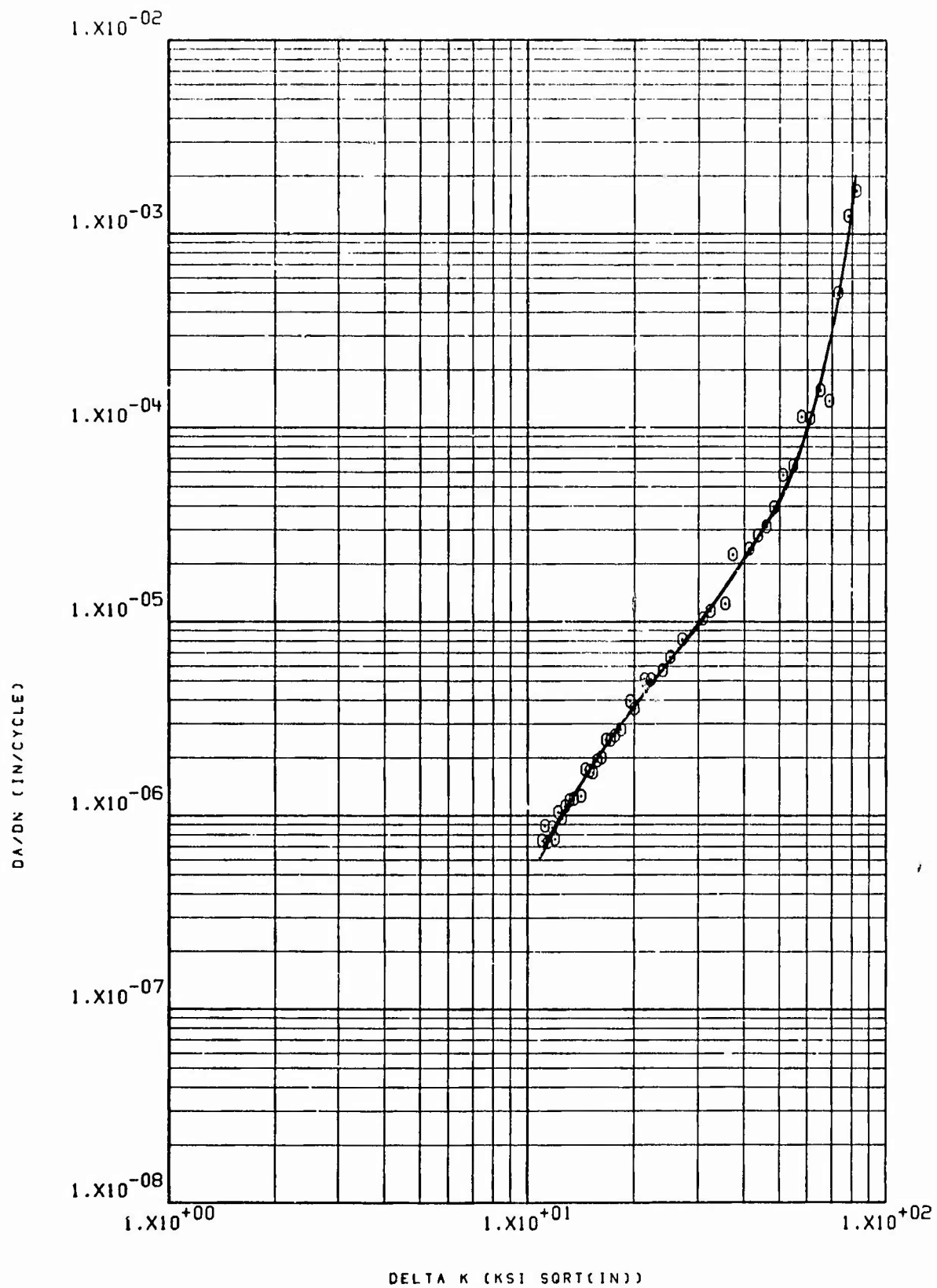


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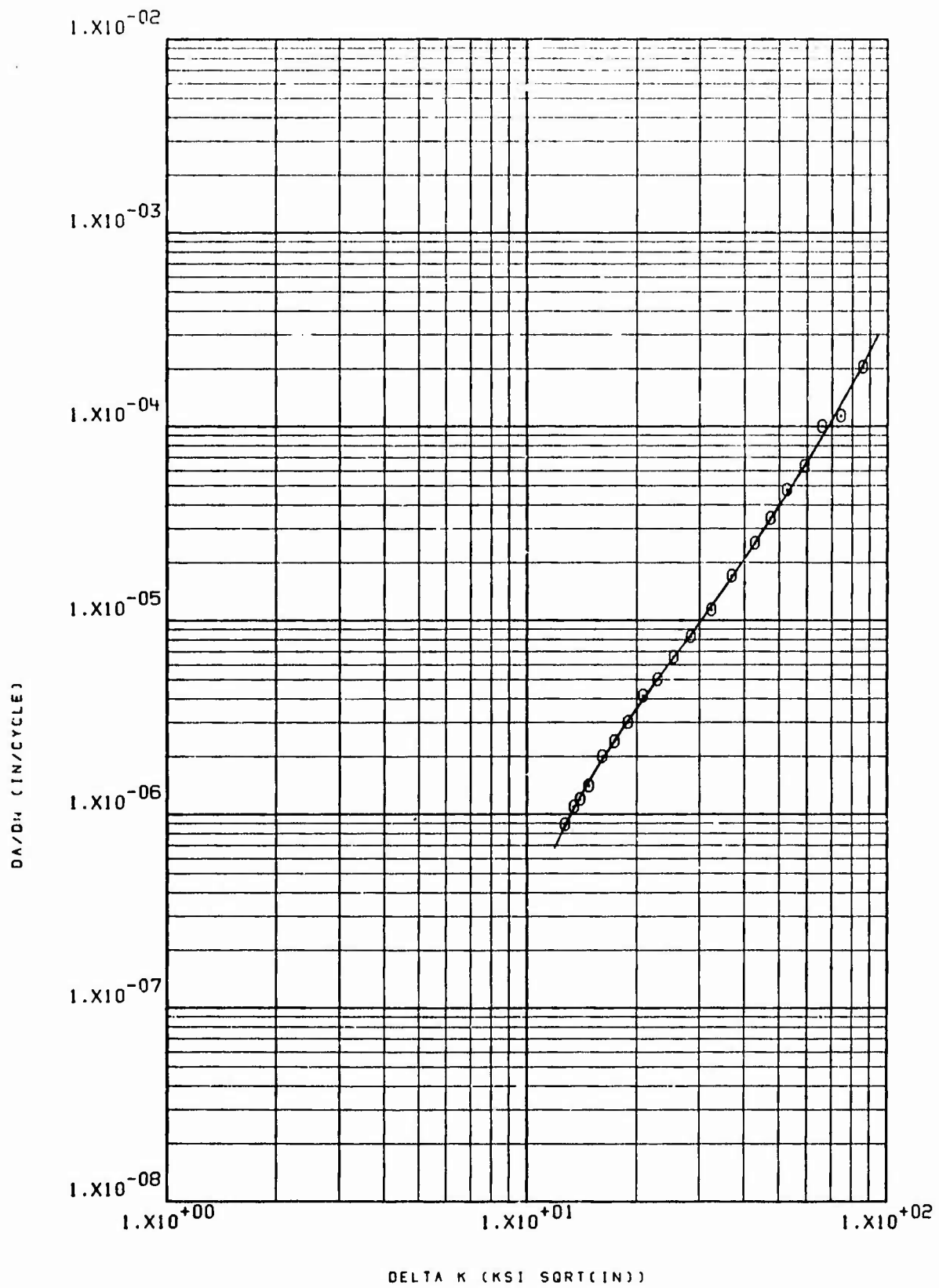


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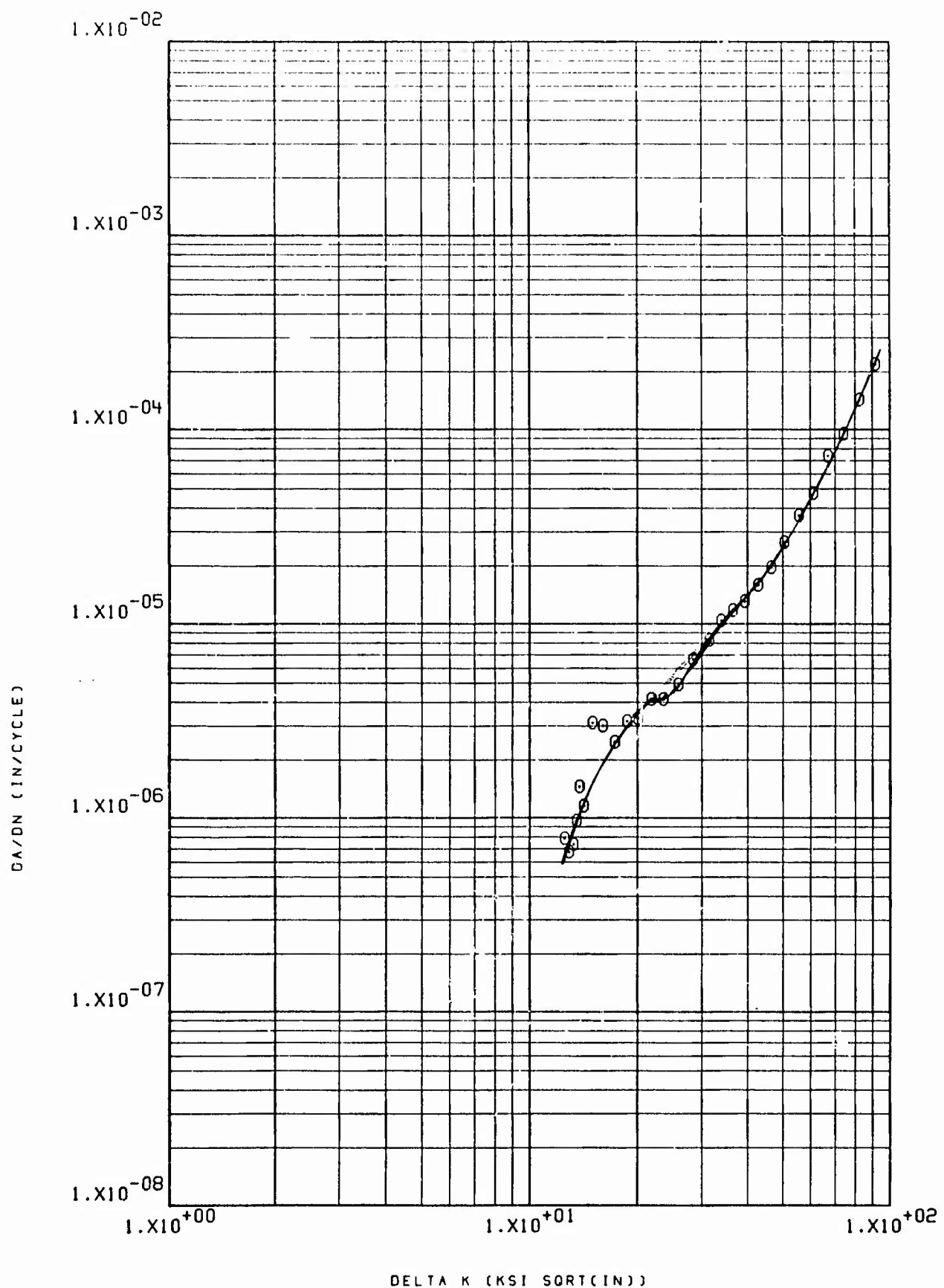


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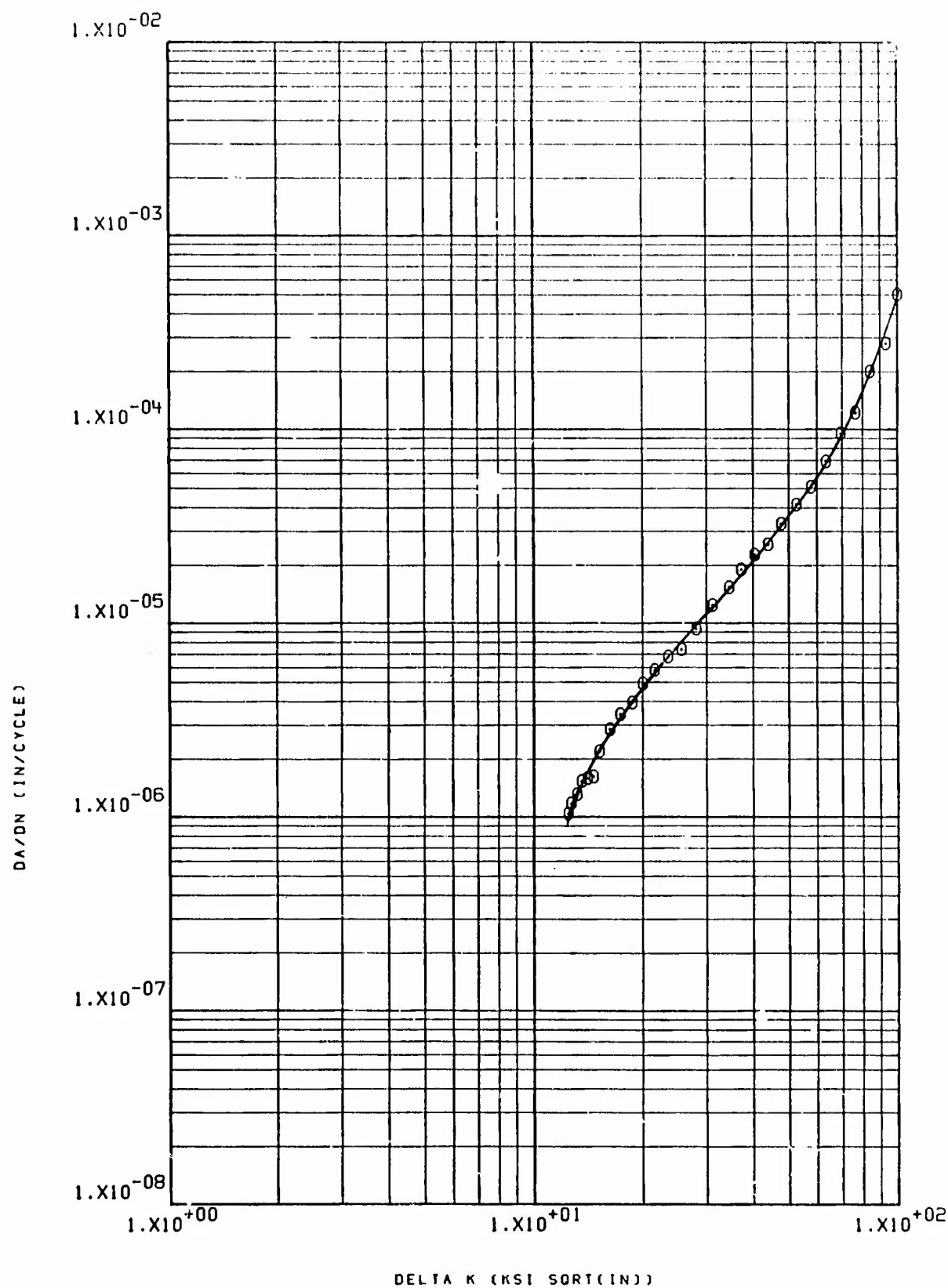


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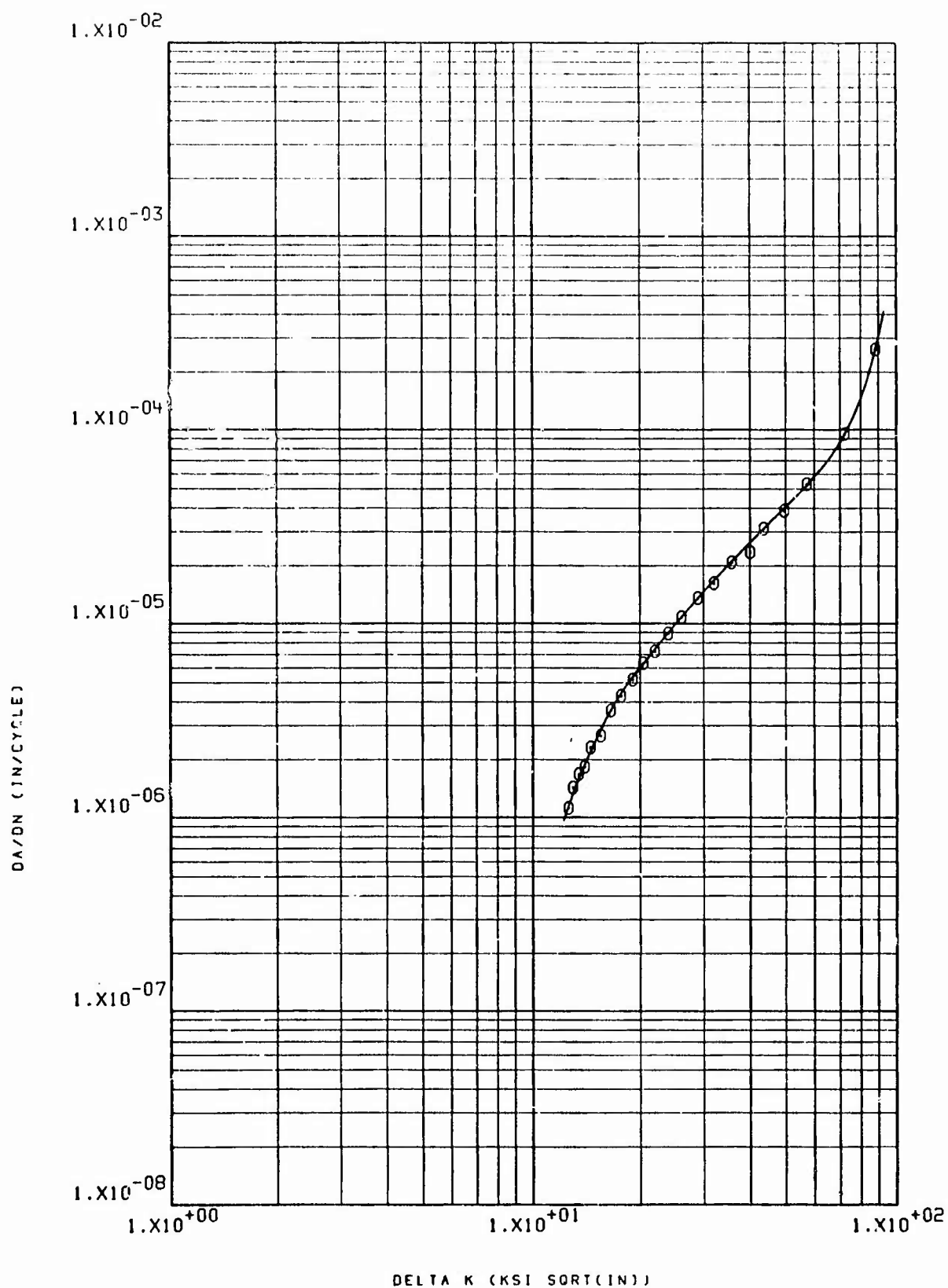
C-5



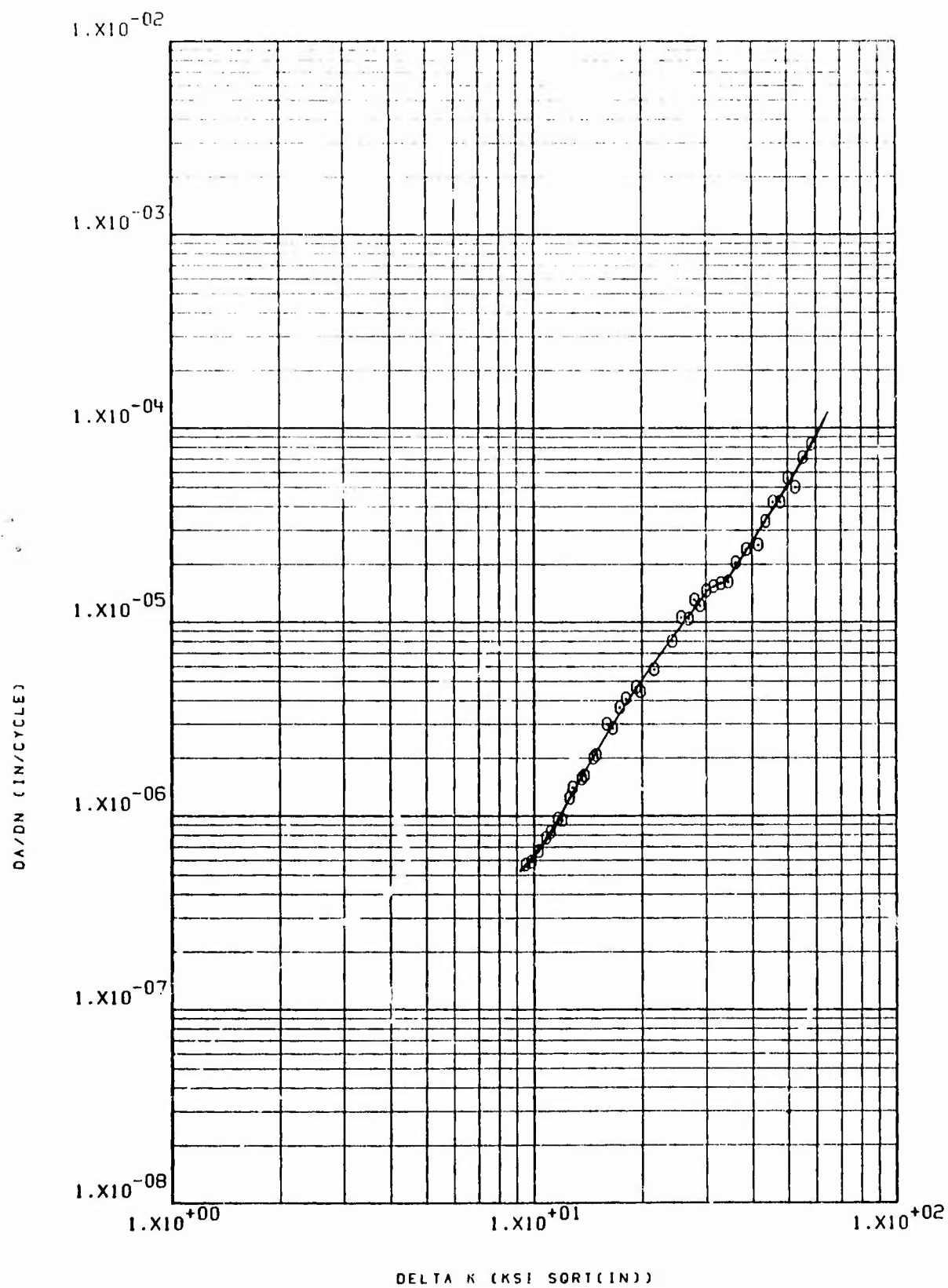
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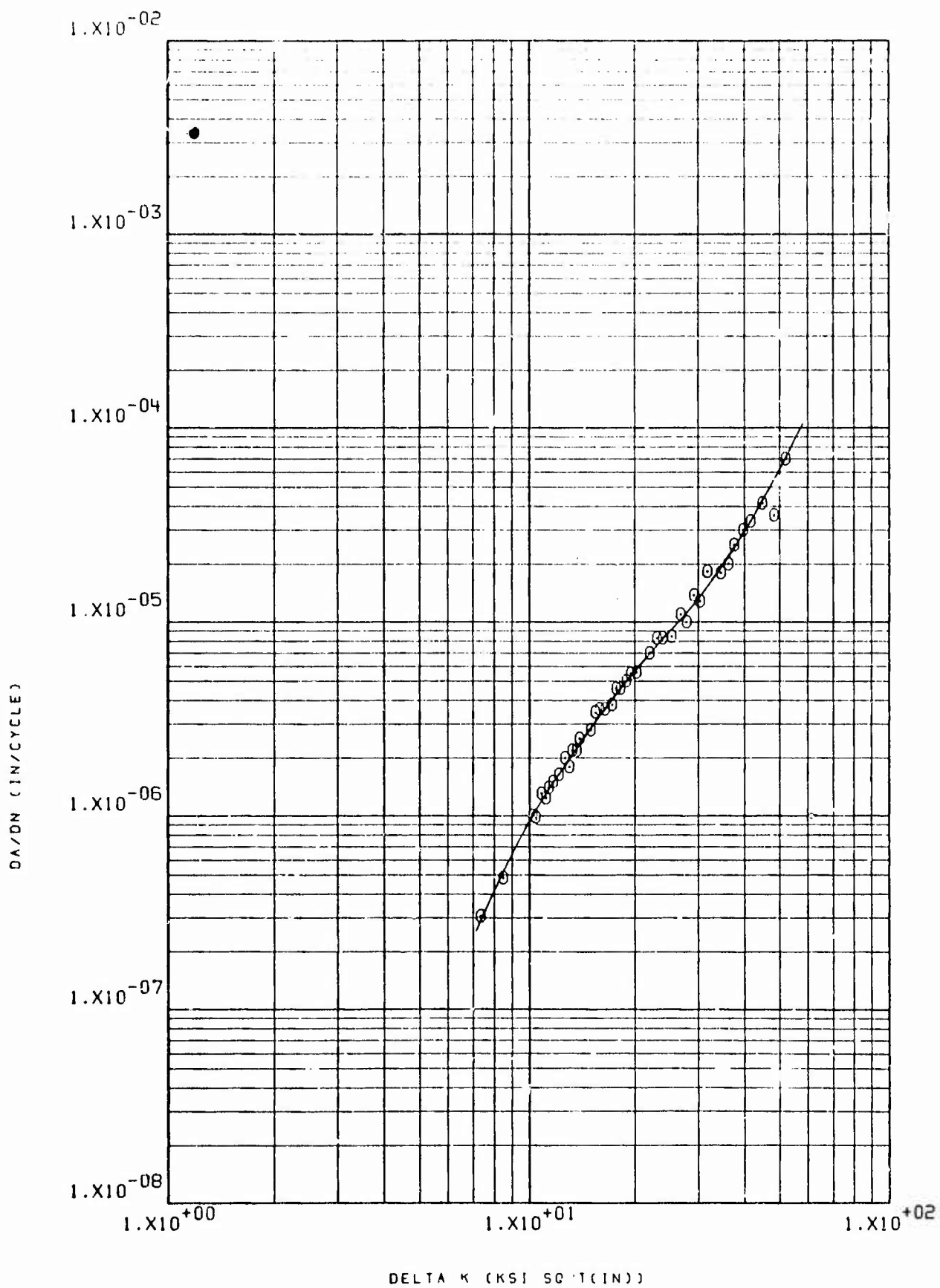
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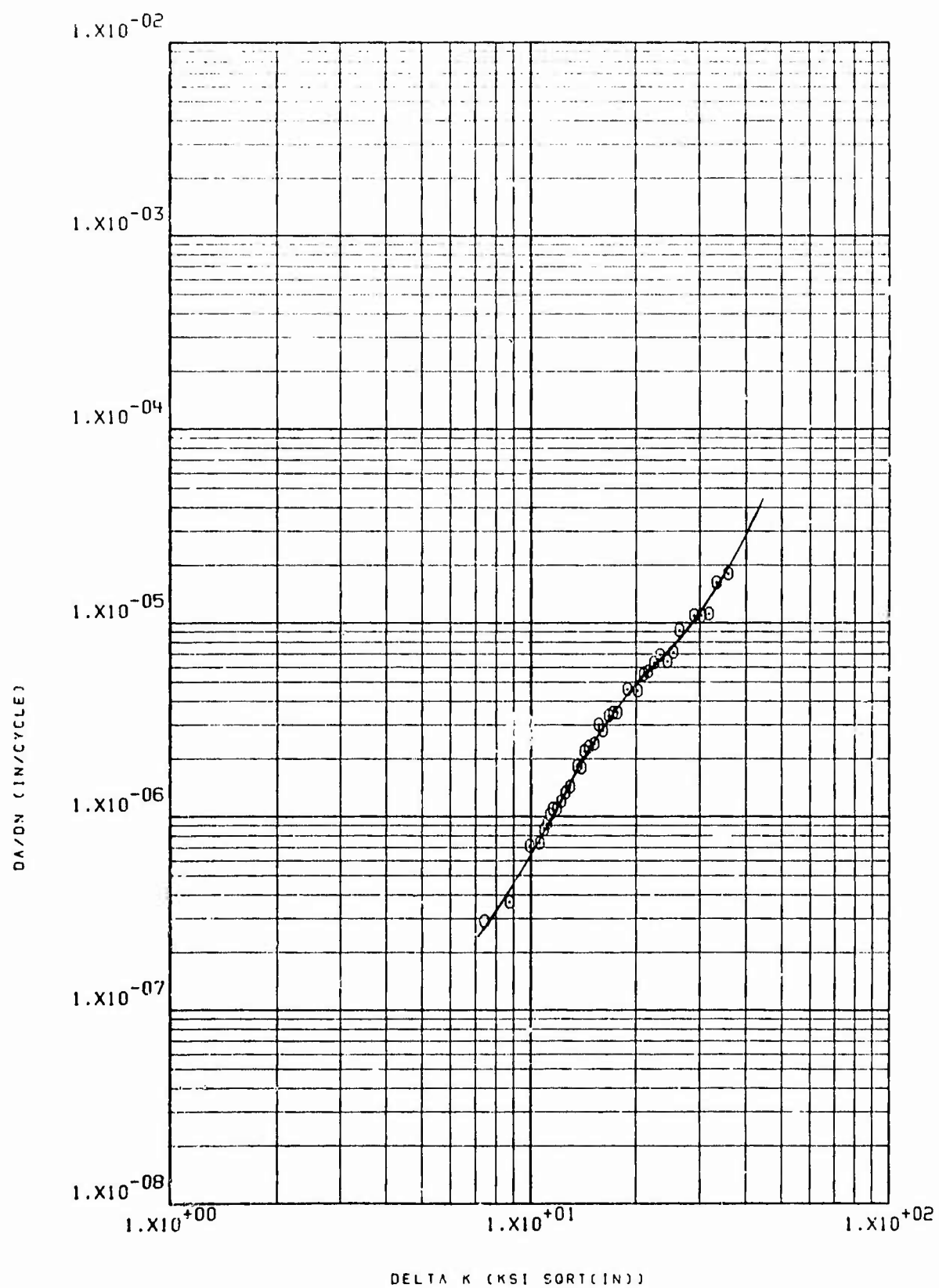
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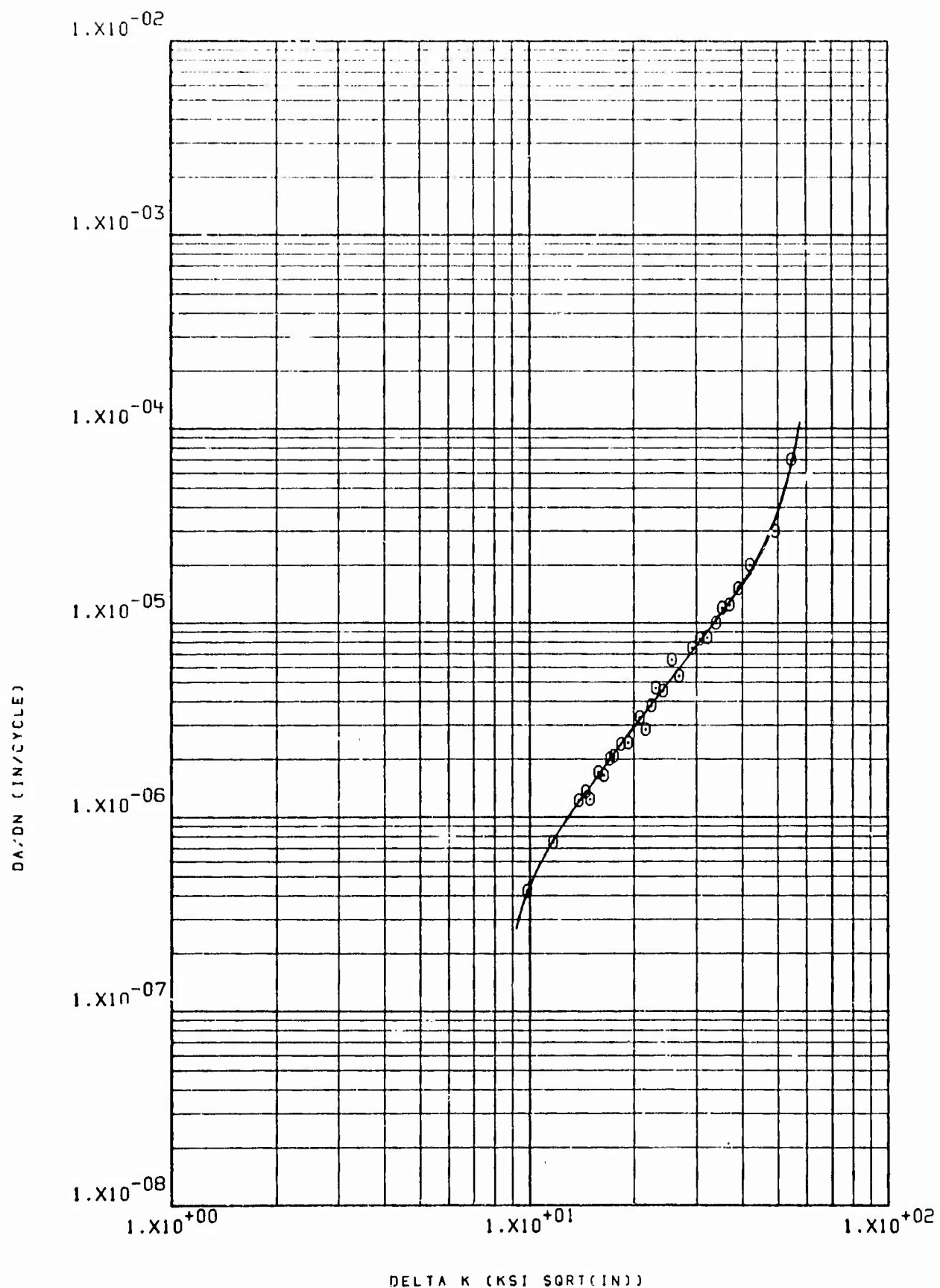
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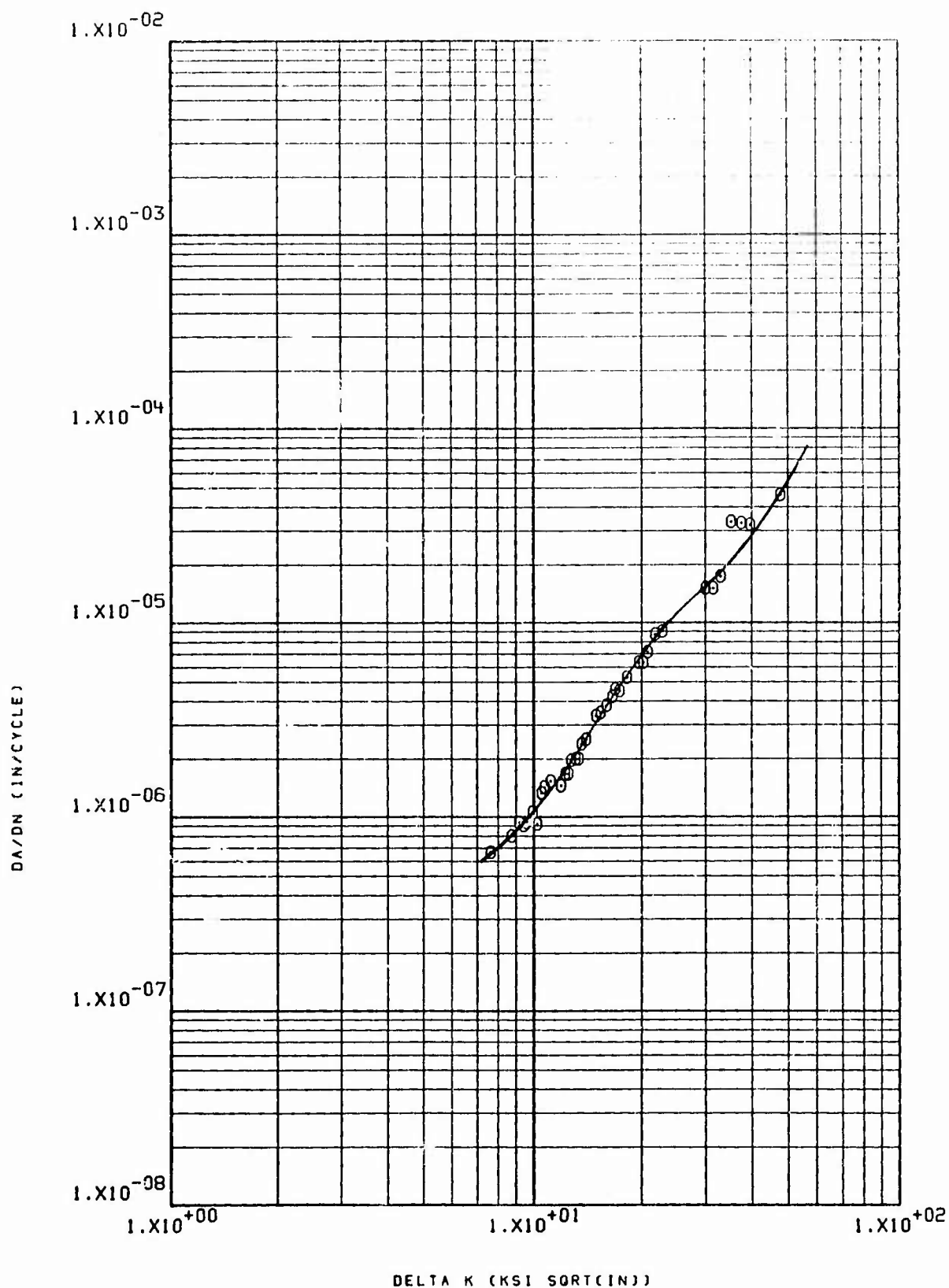
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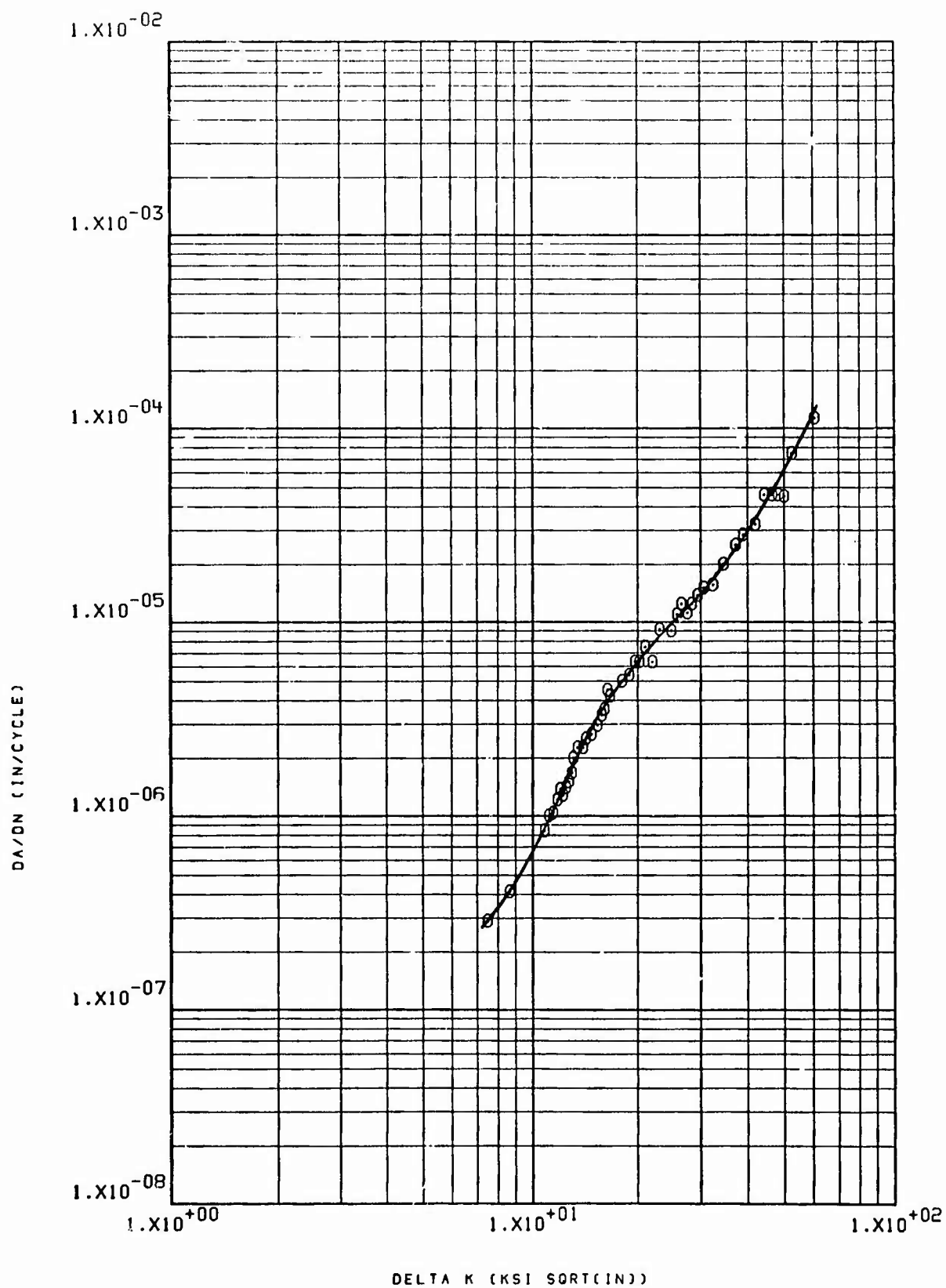
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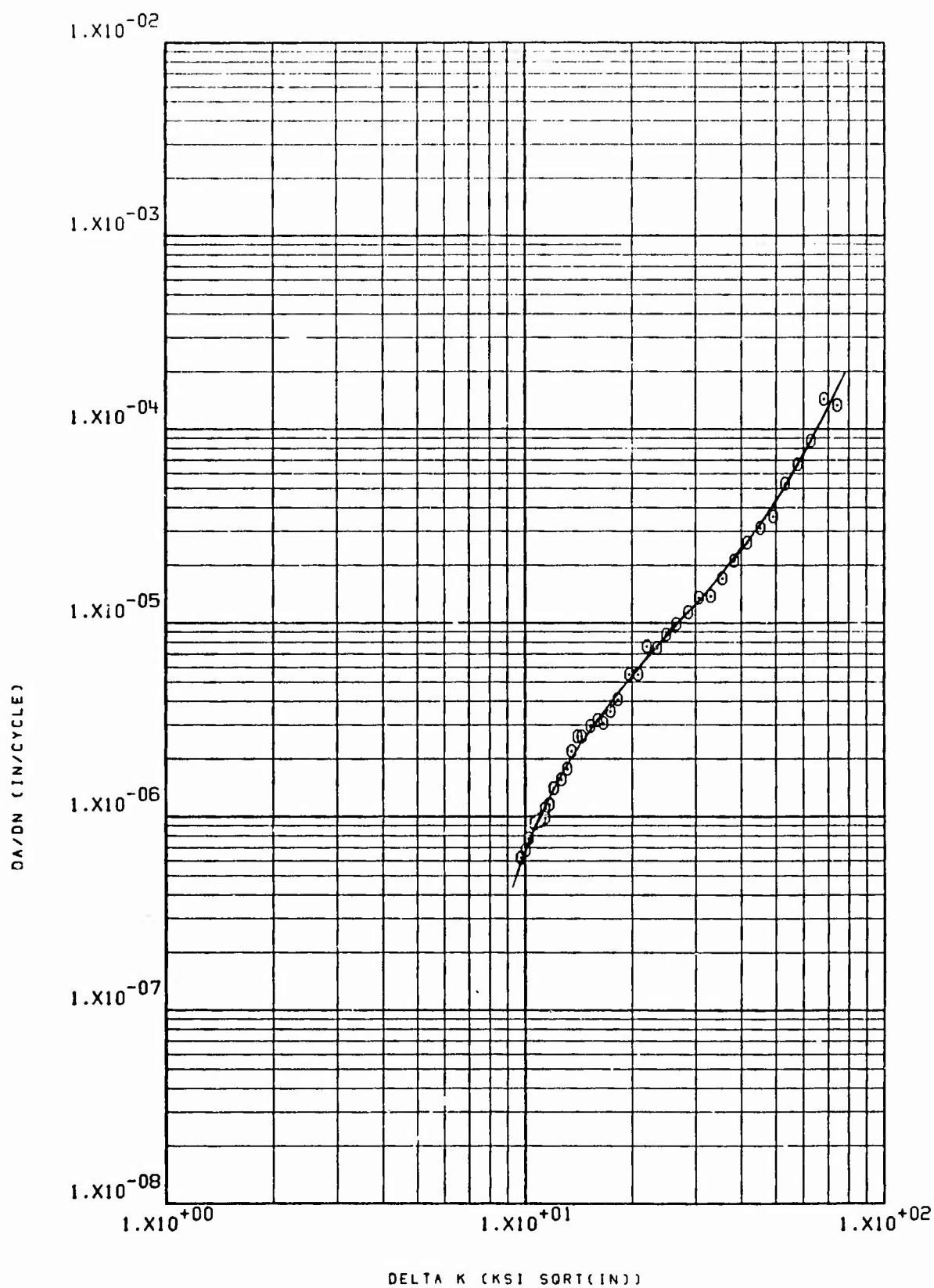
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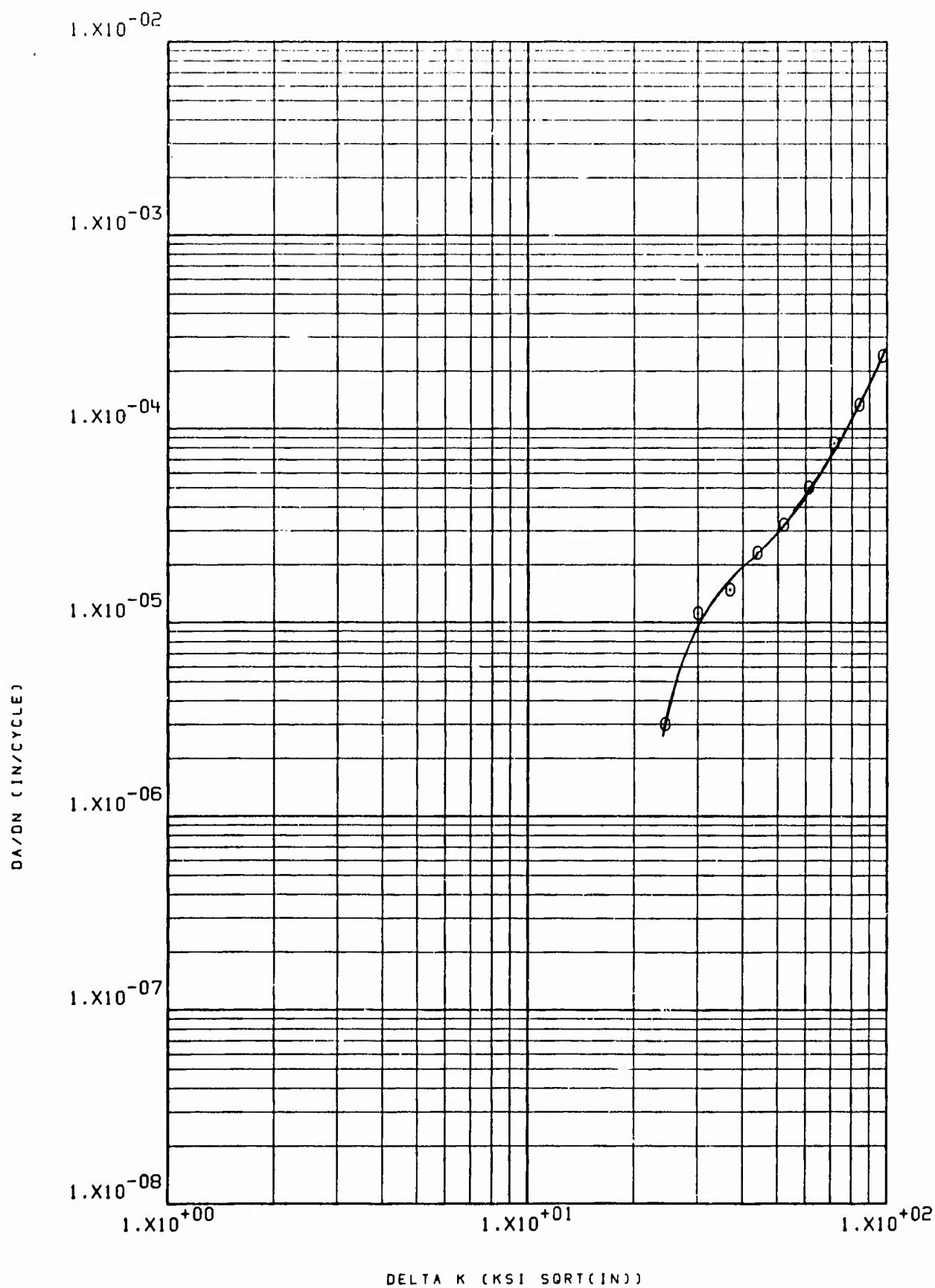
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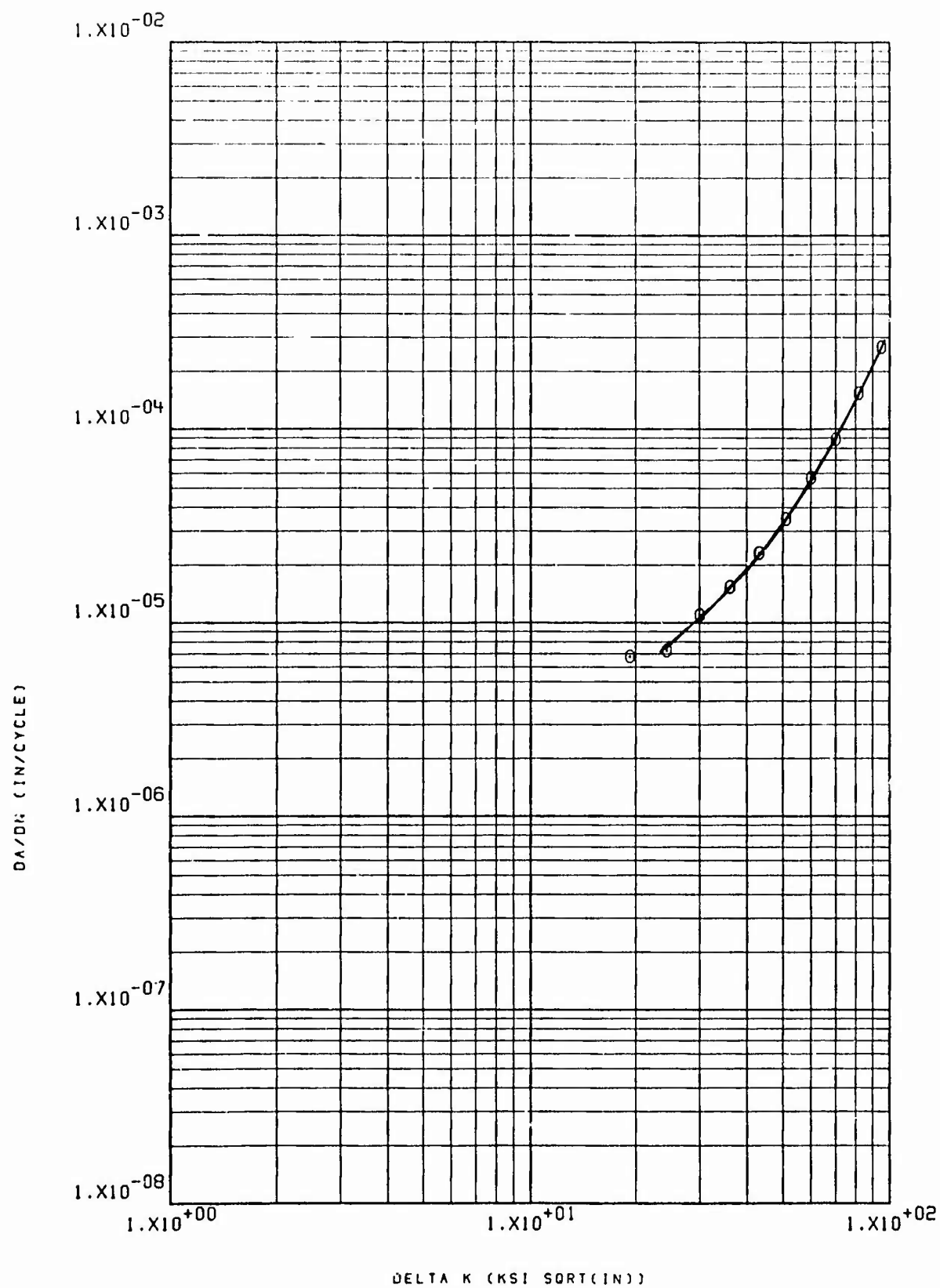


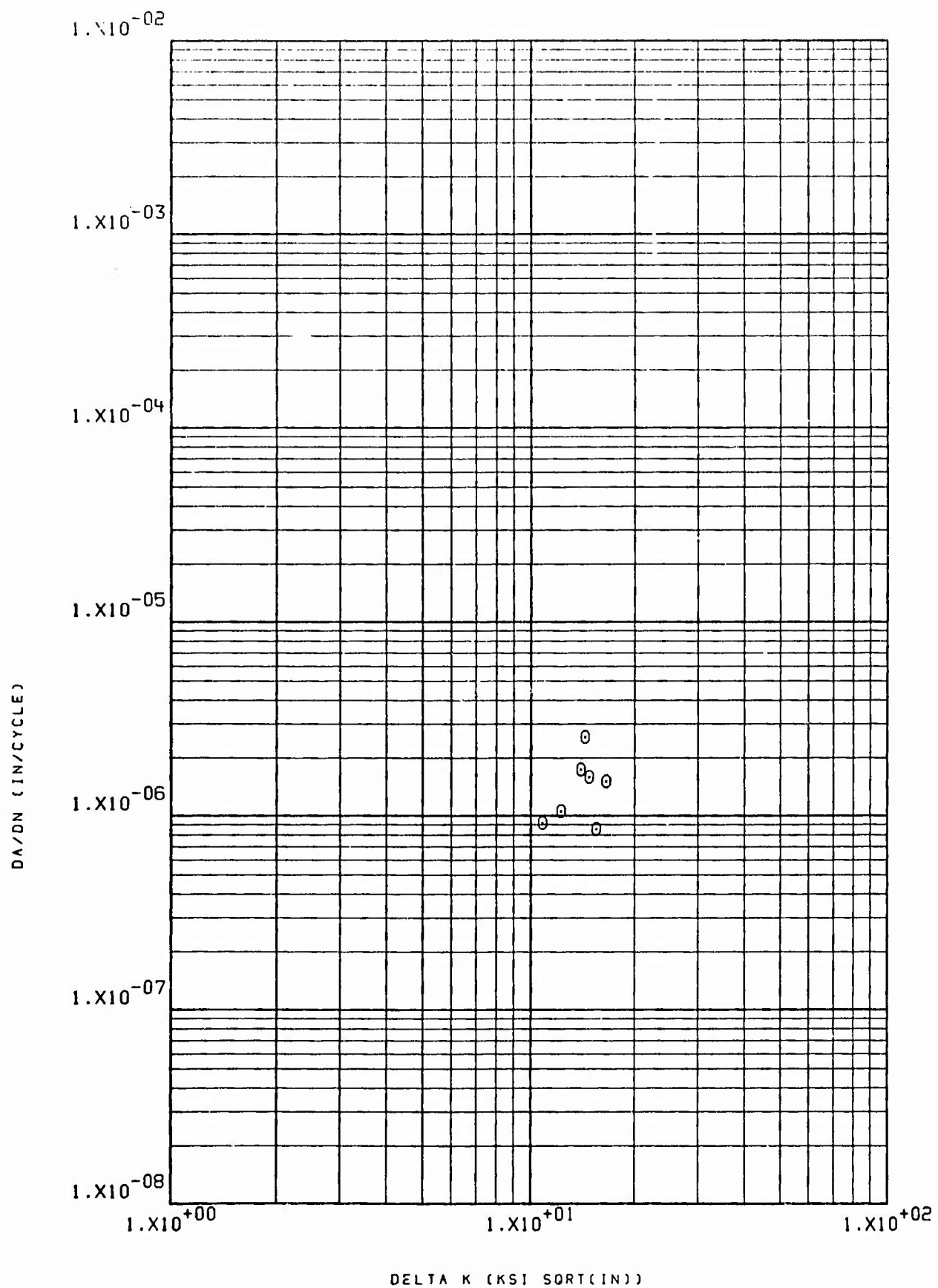
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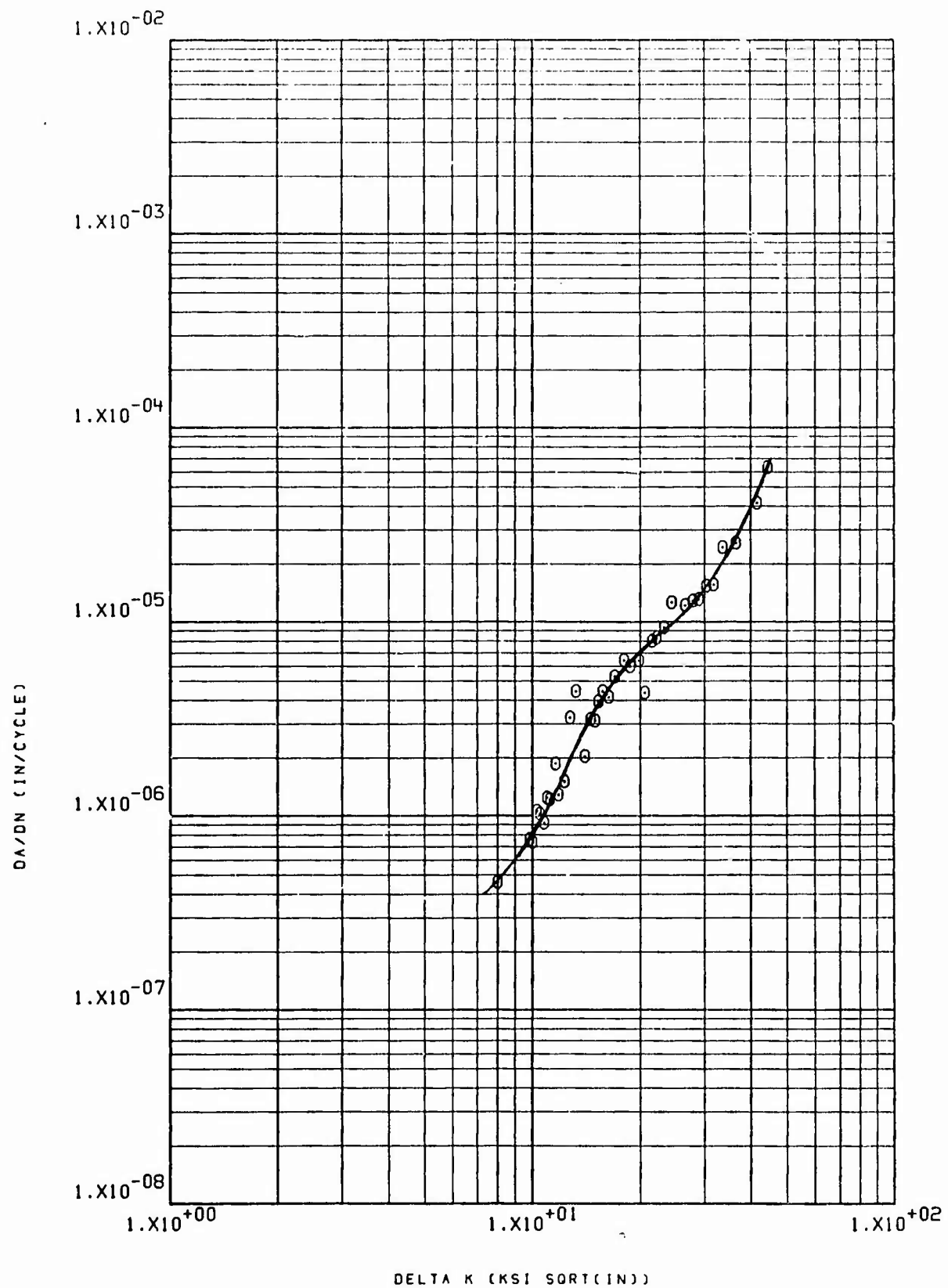


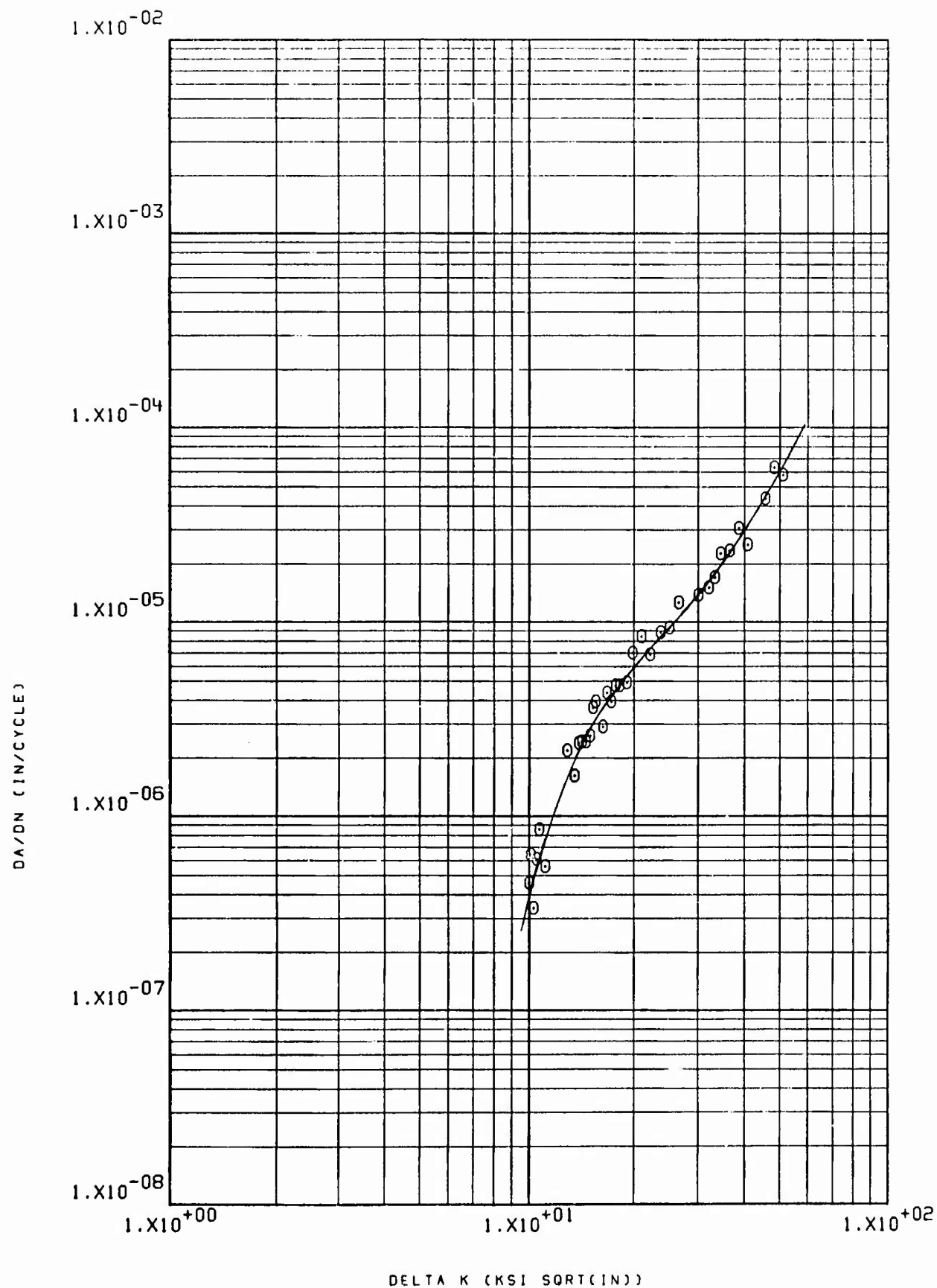
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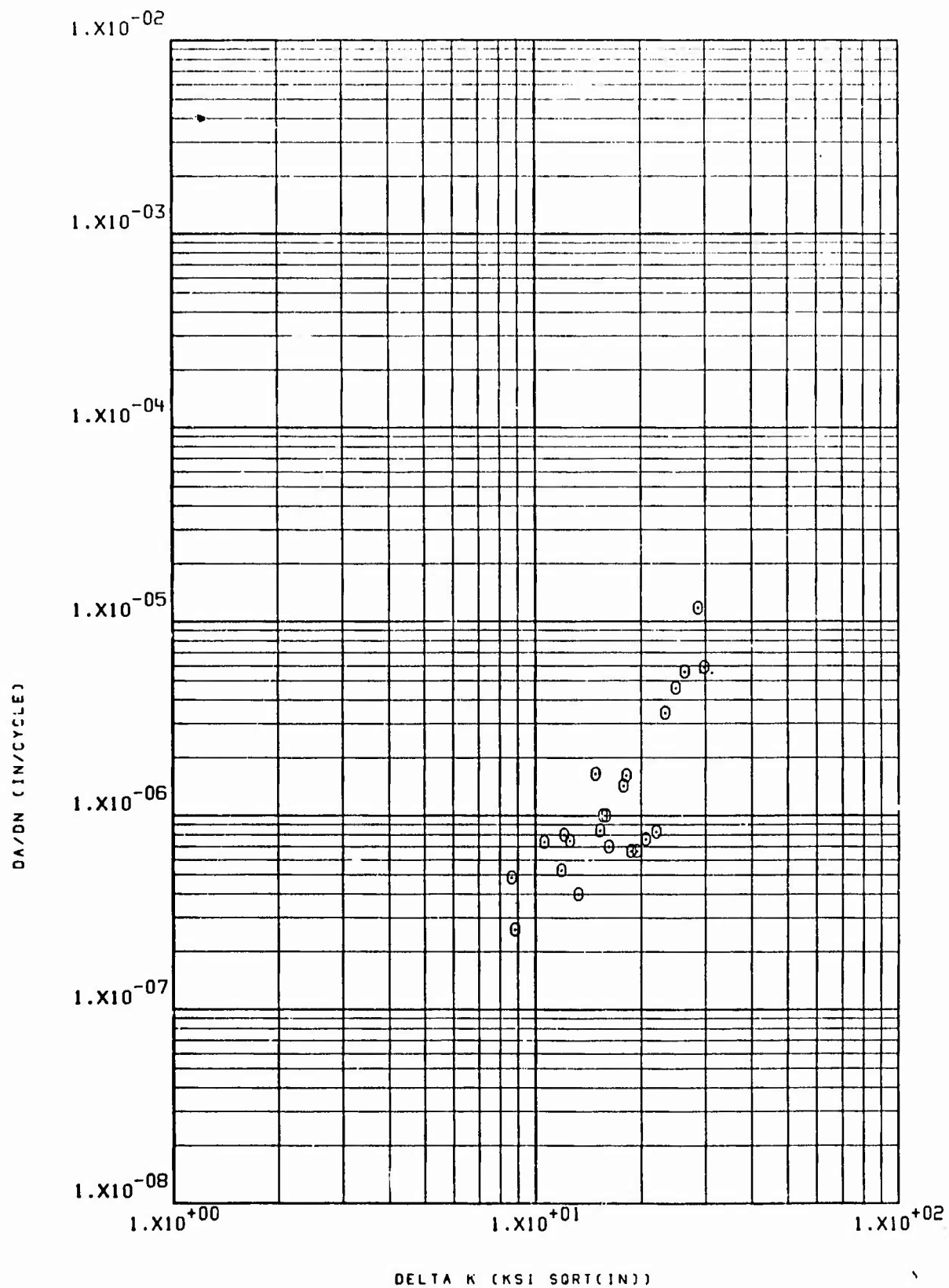


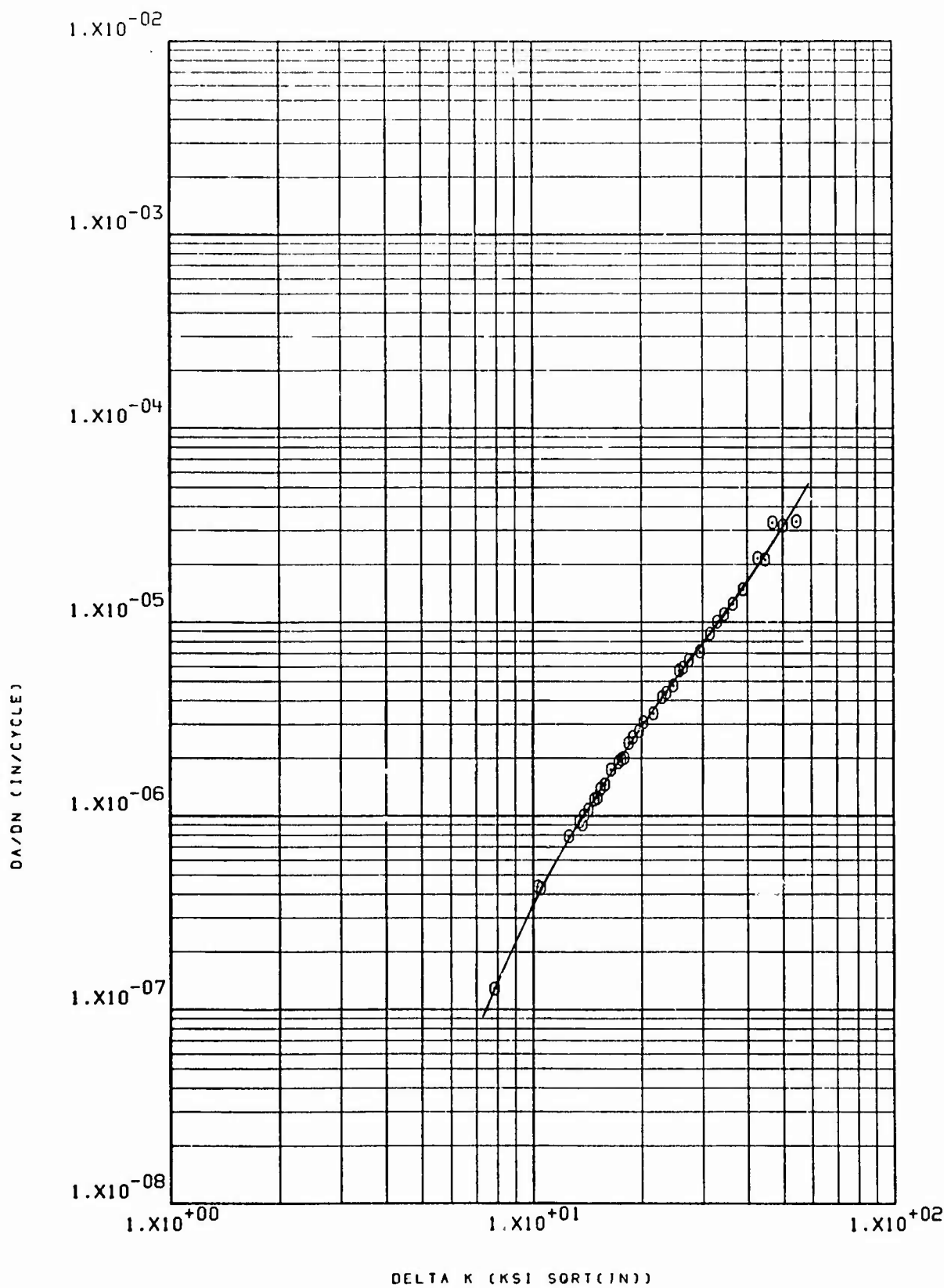




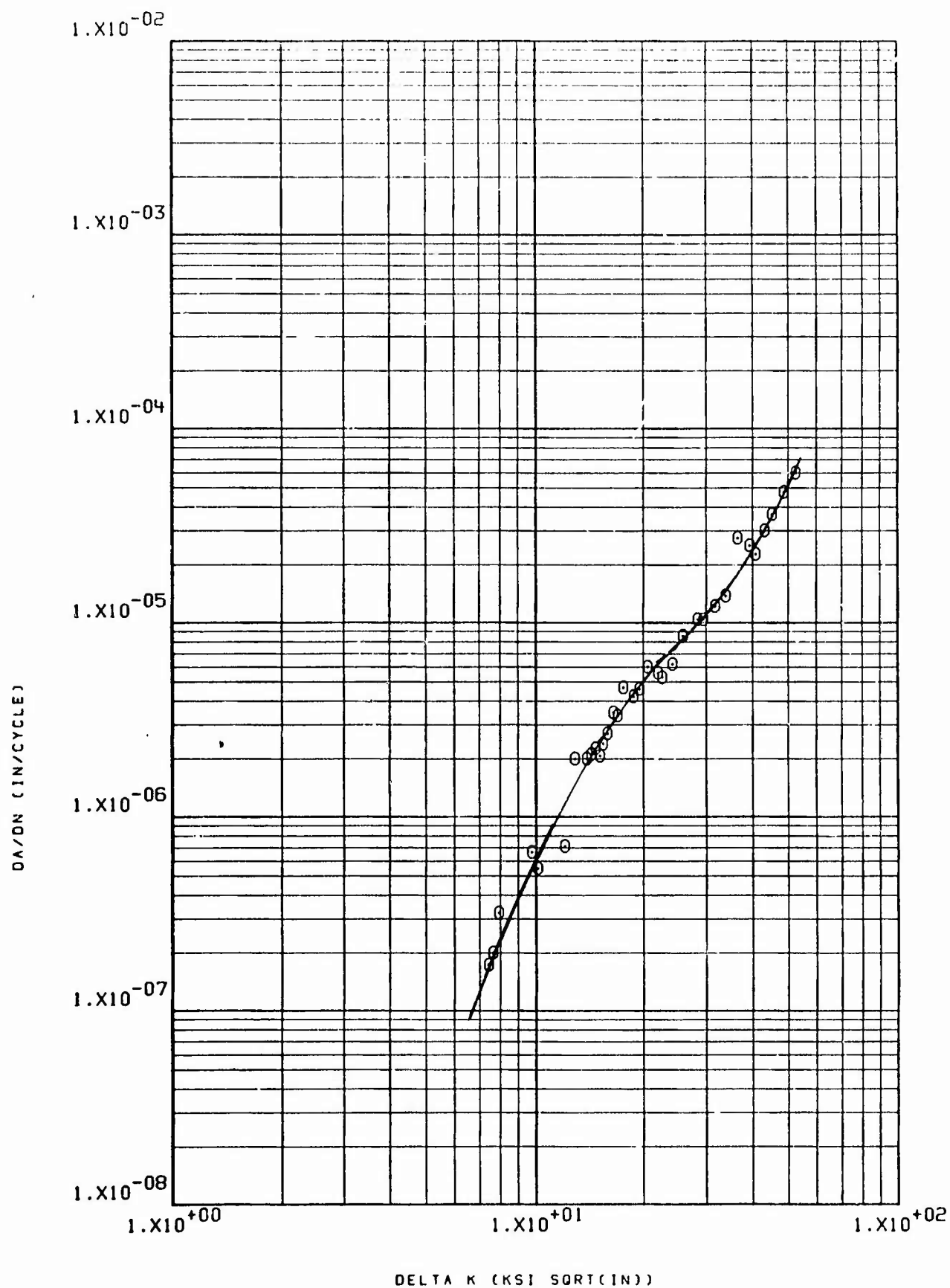


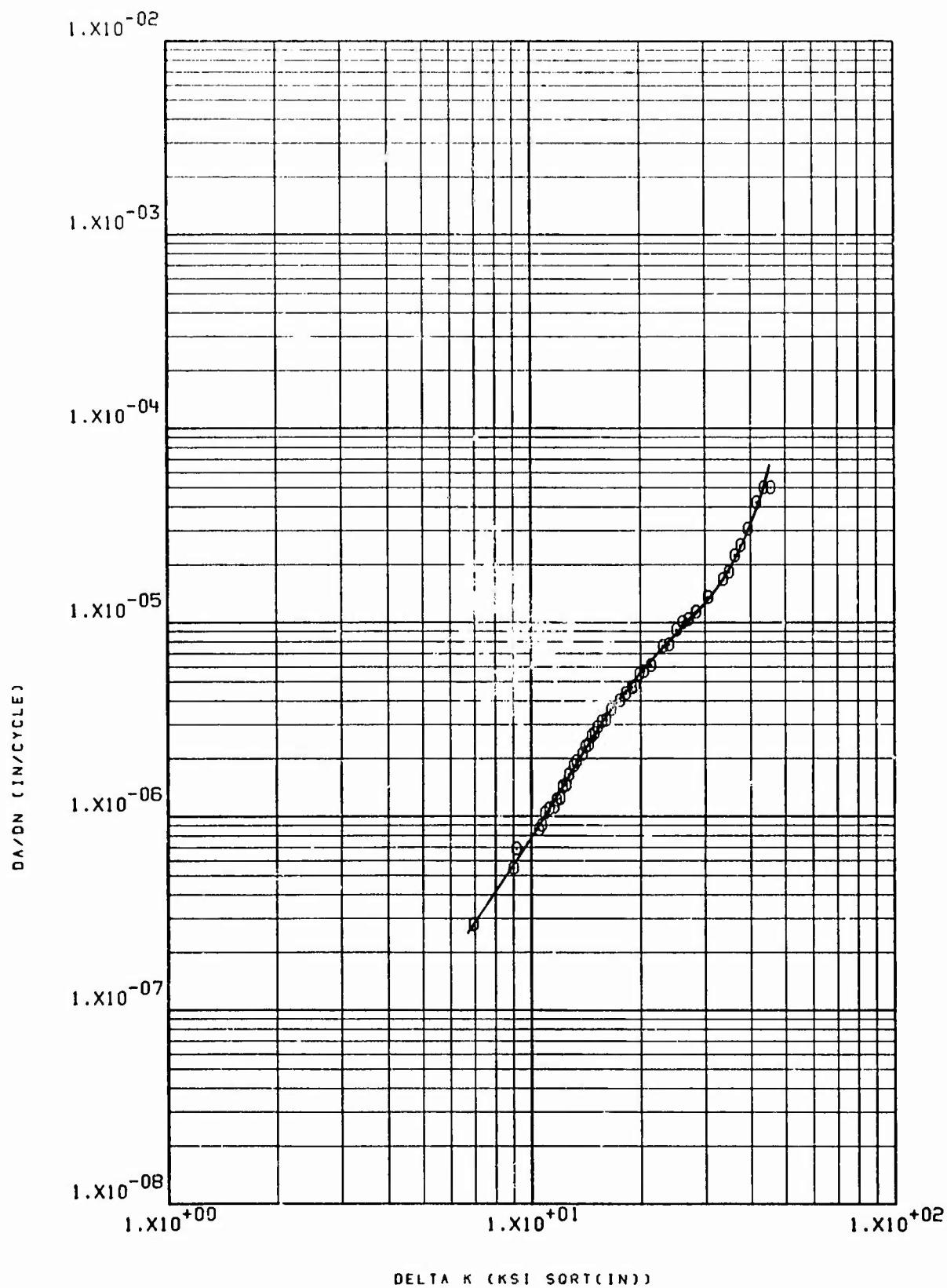




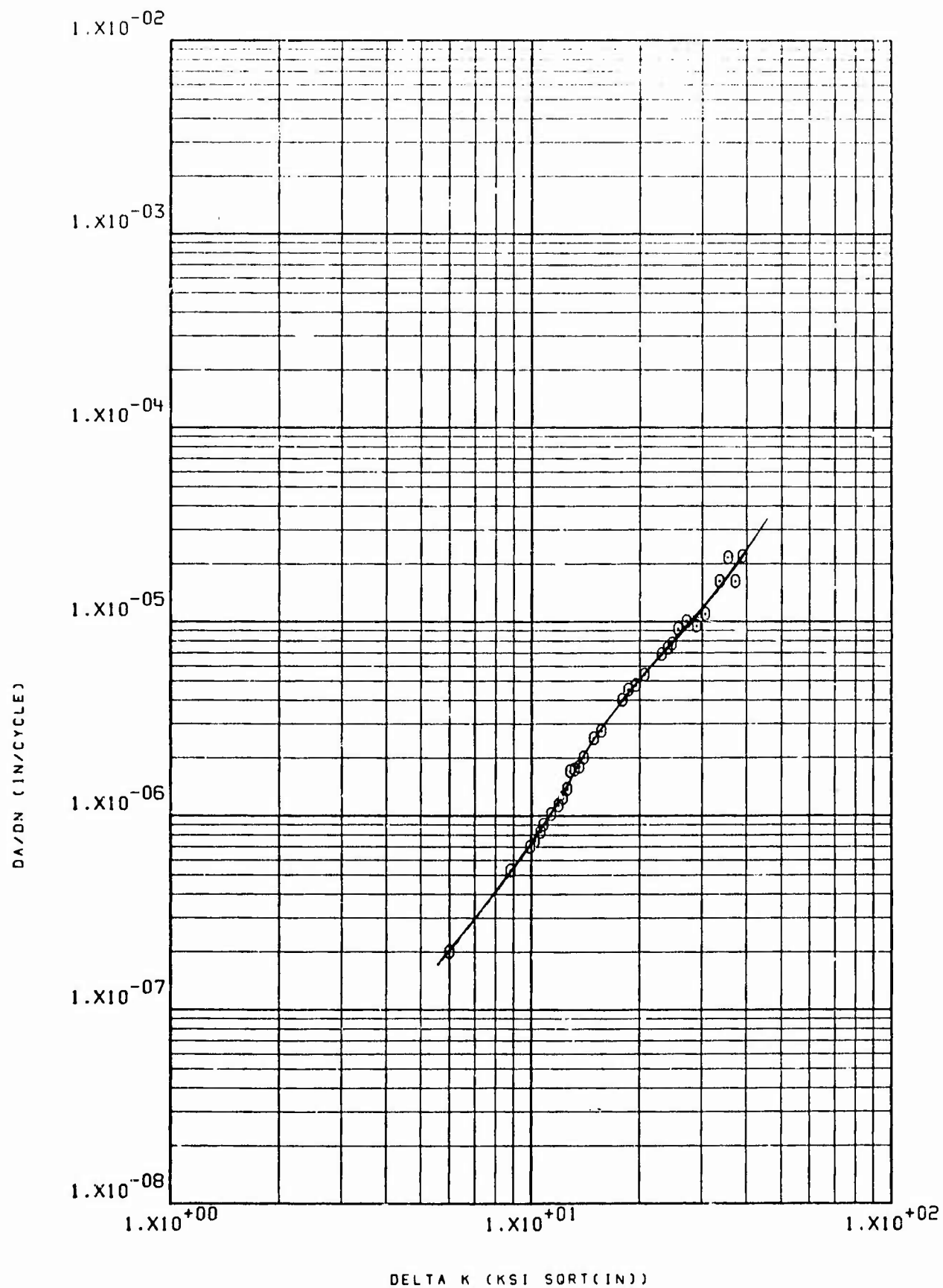


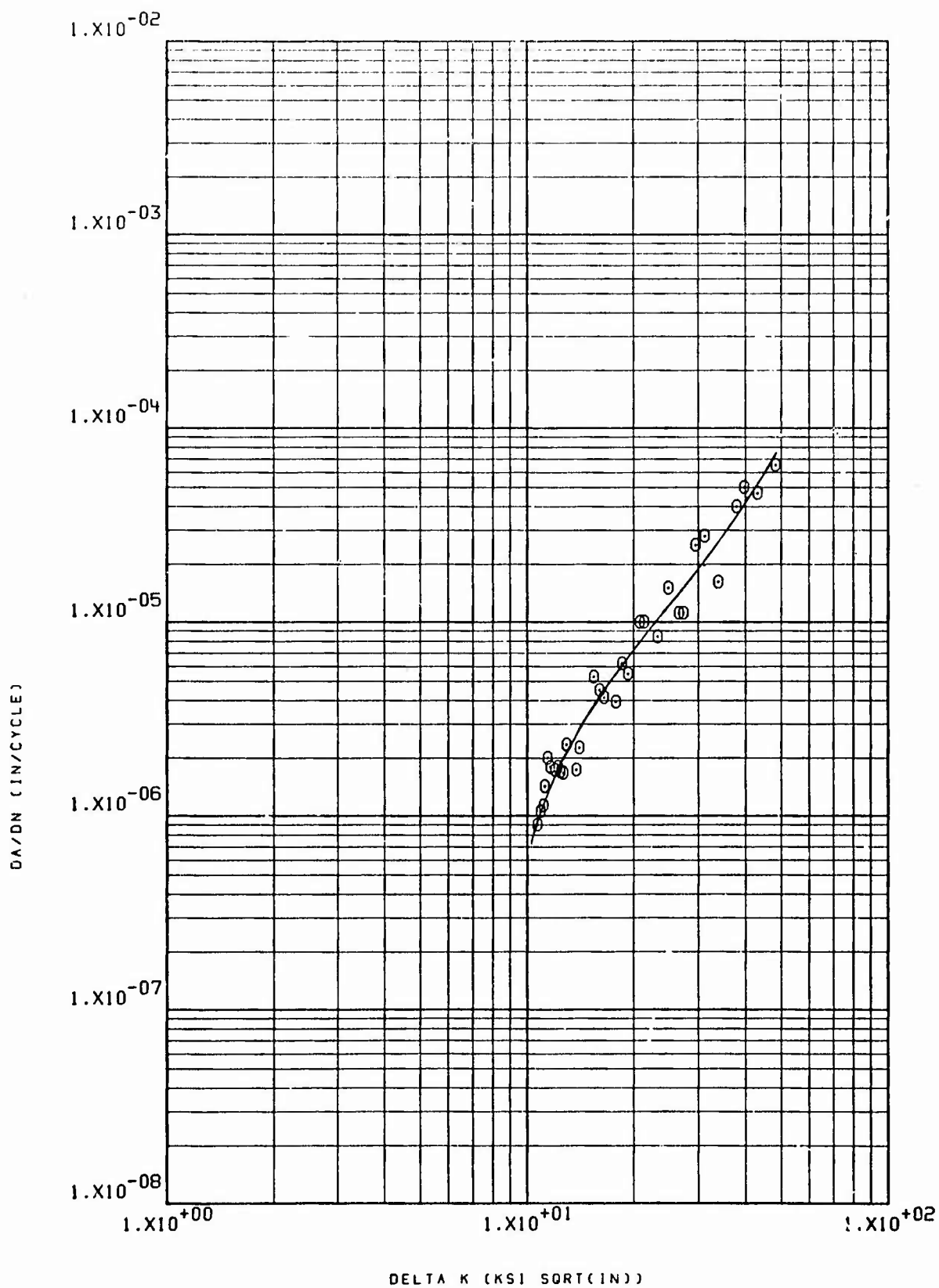
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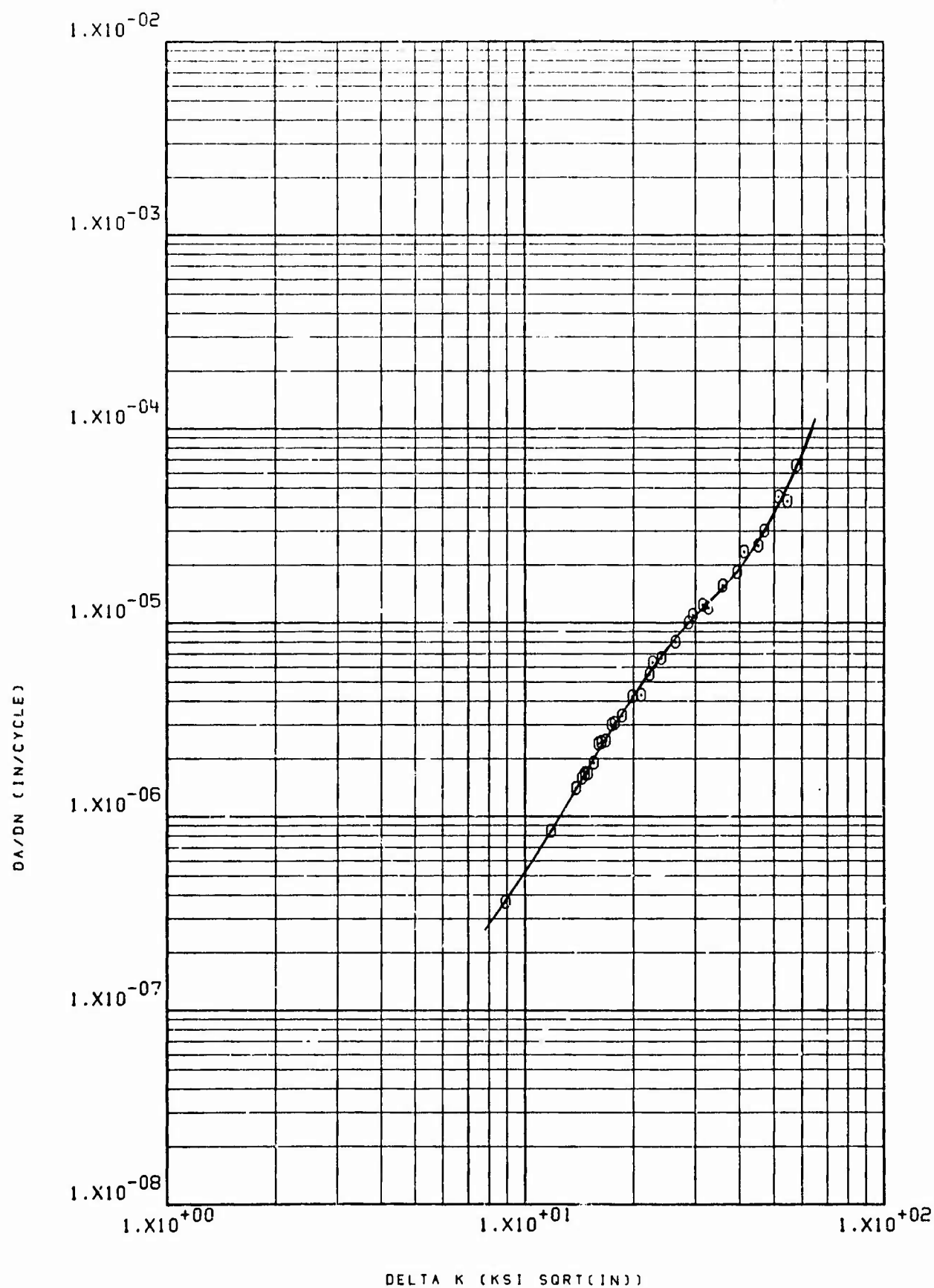


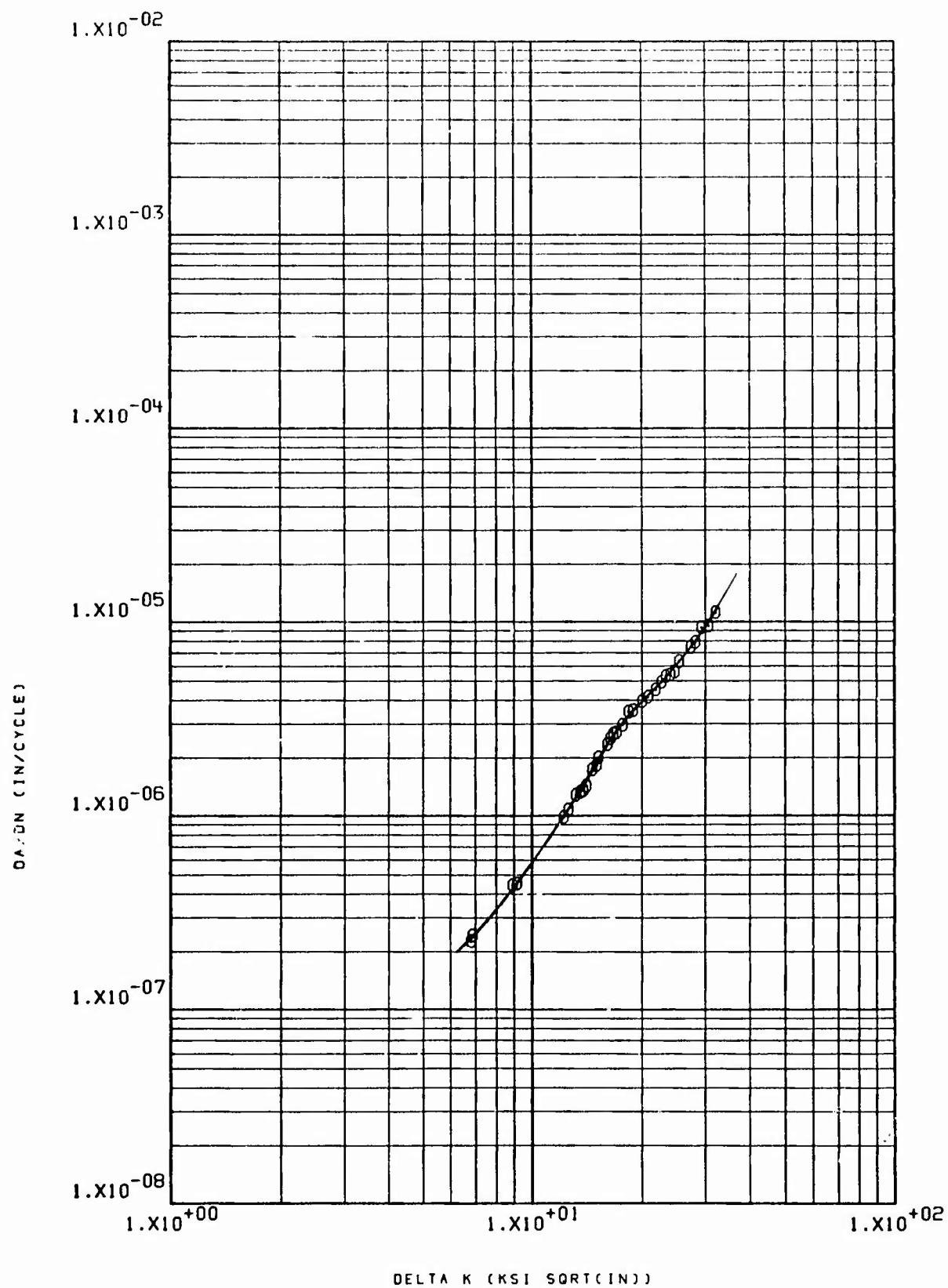


35 NRW 20-9 HP 9-4-30 HT LHA RT R=.5 360CPH

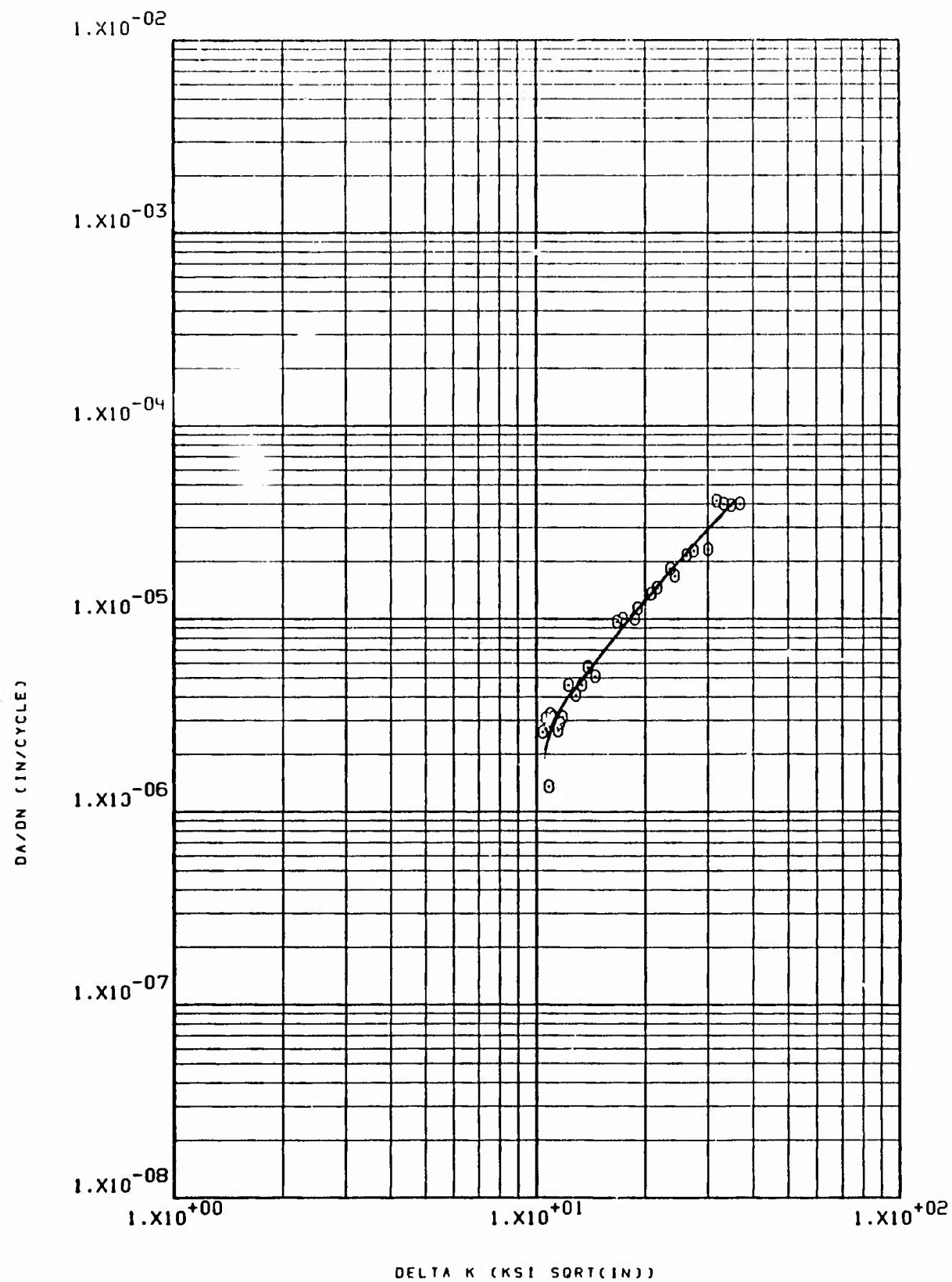




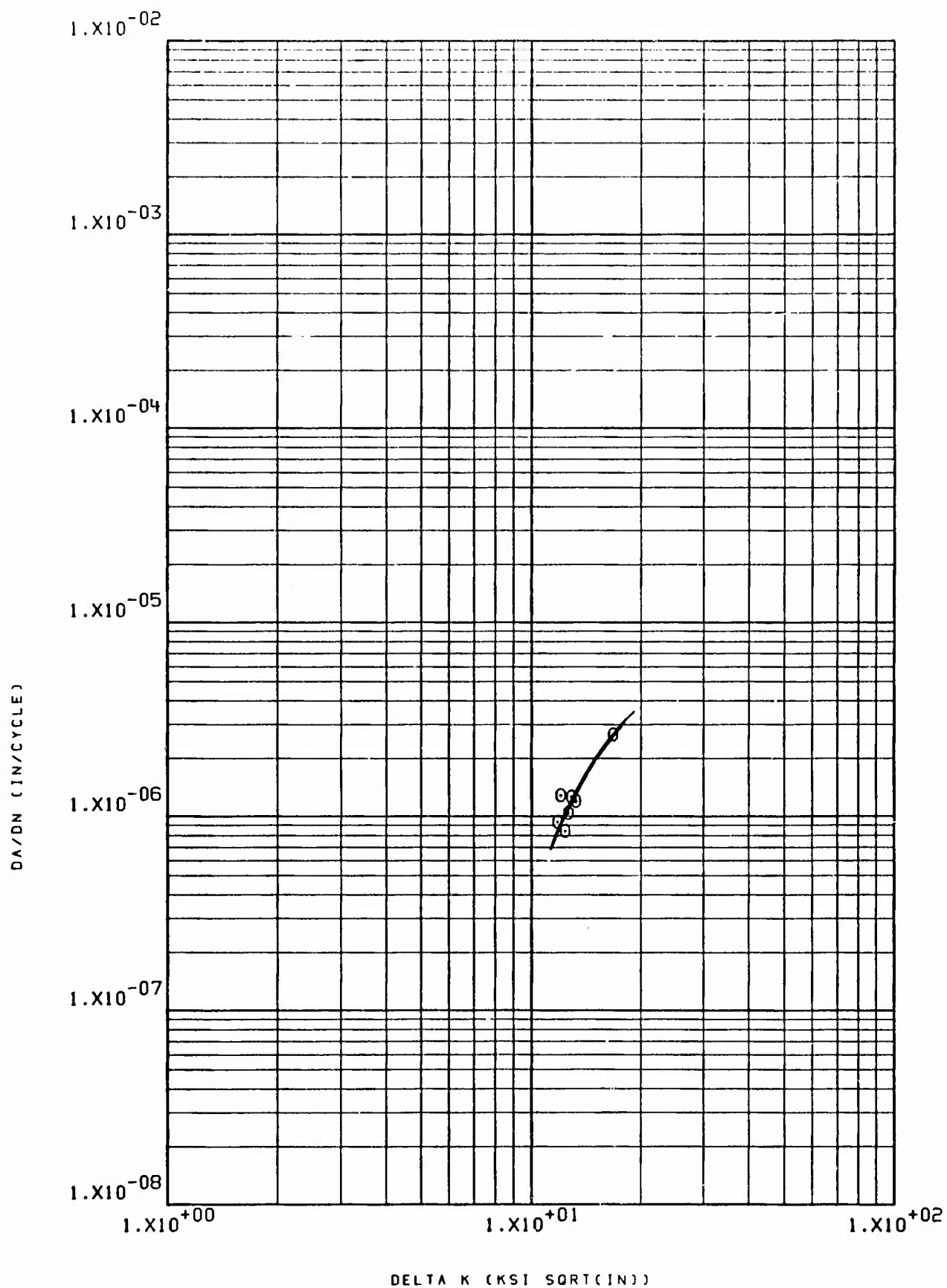


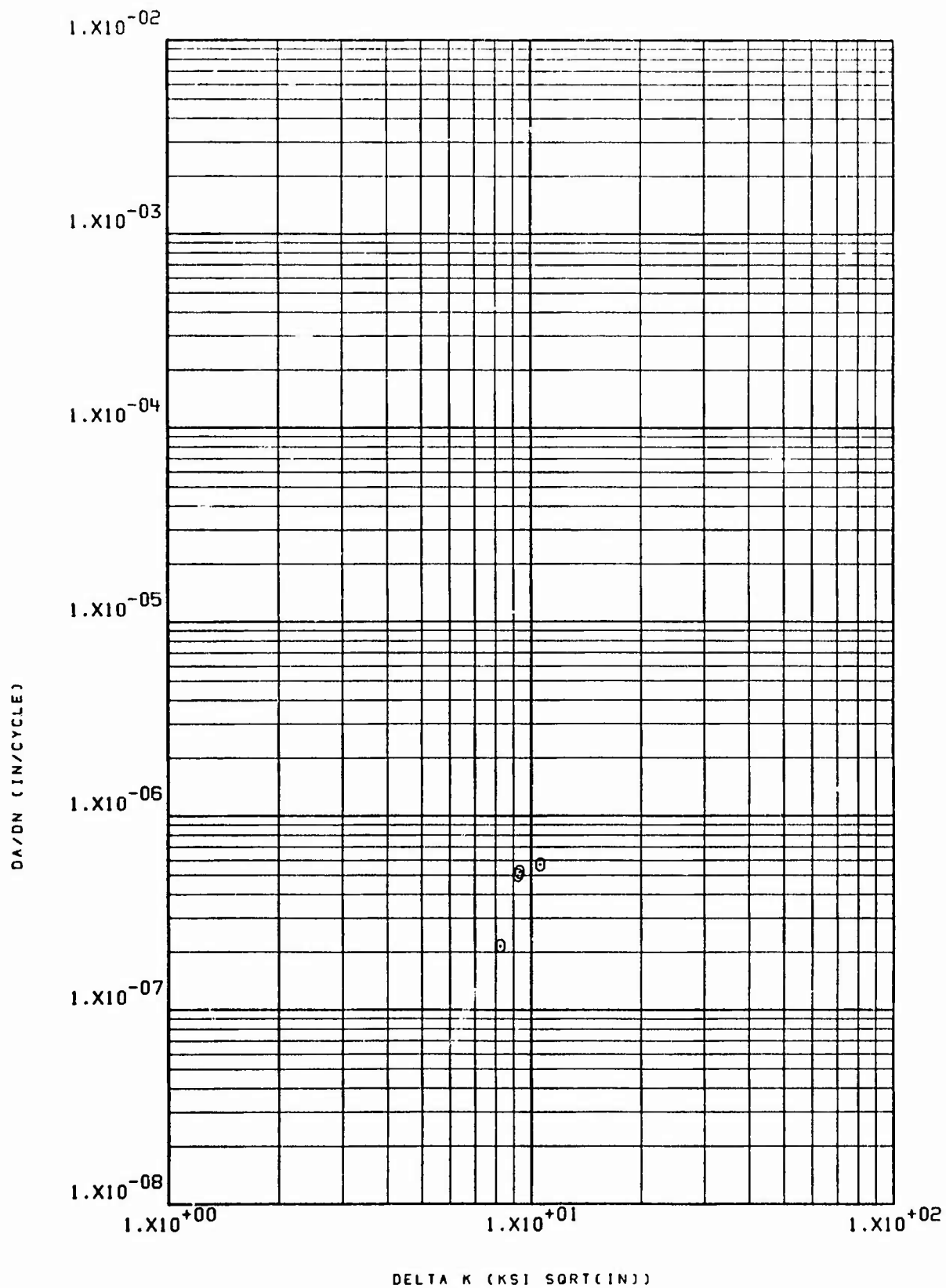


35 NRW 20-13 HP9-4-30 HT LHA RT 60CPH R=.08

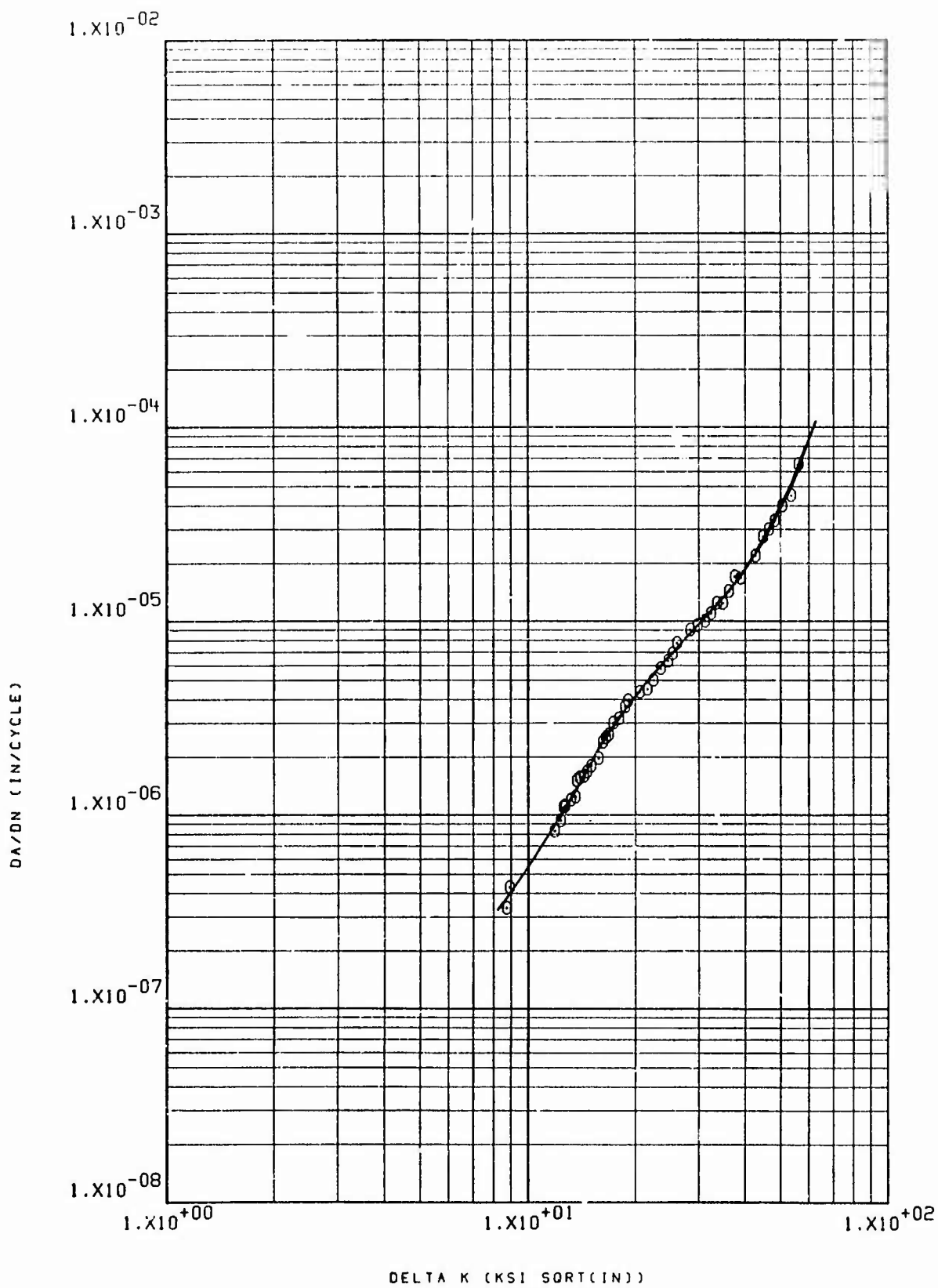


35 NRW 20-14 9-4-30 HT STW RT R=.08 6CPM

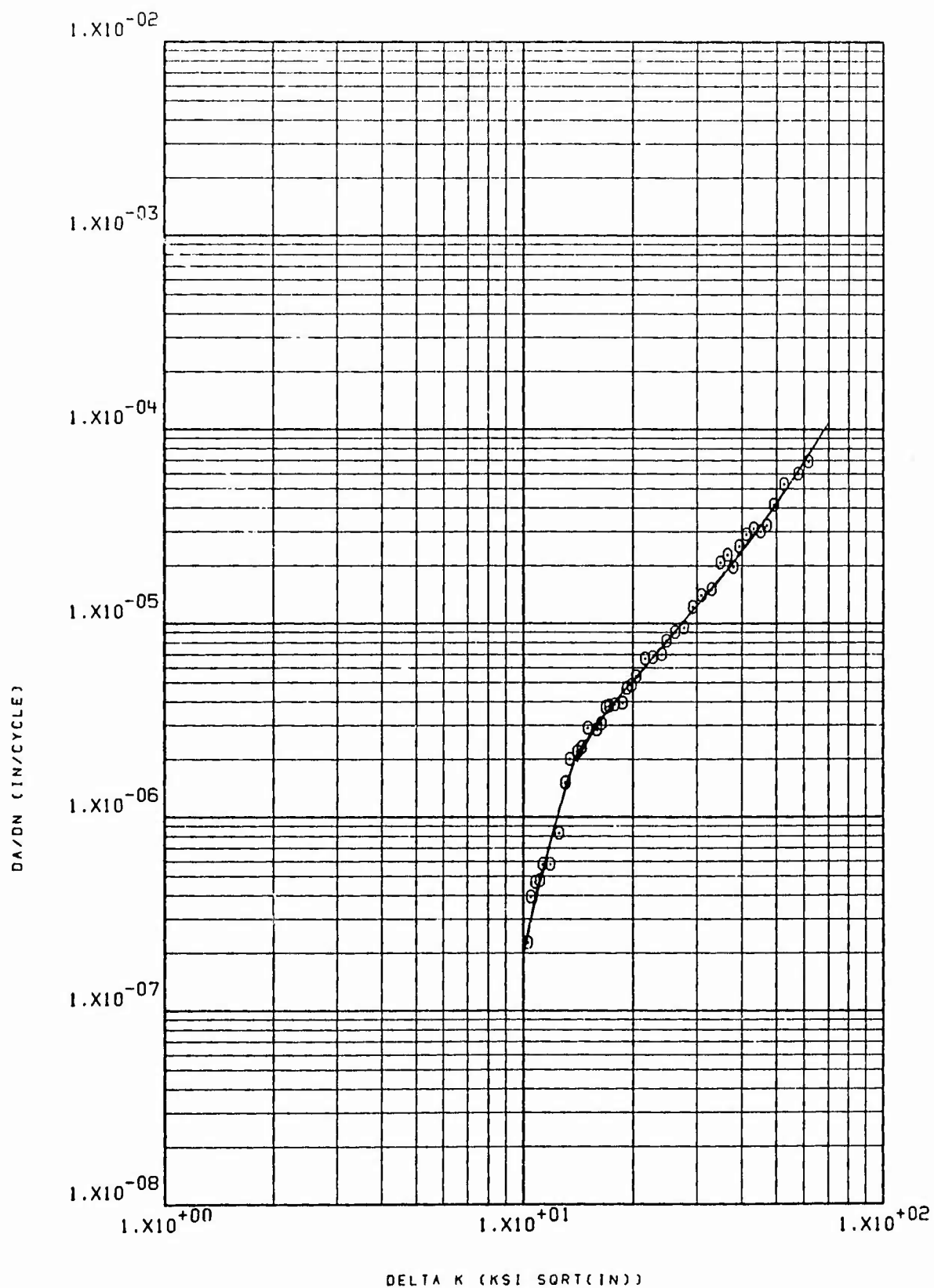




35 NWR 20-16 HP 9-4-30 HT SUMP RT R=.08 60CPM

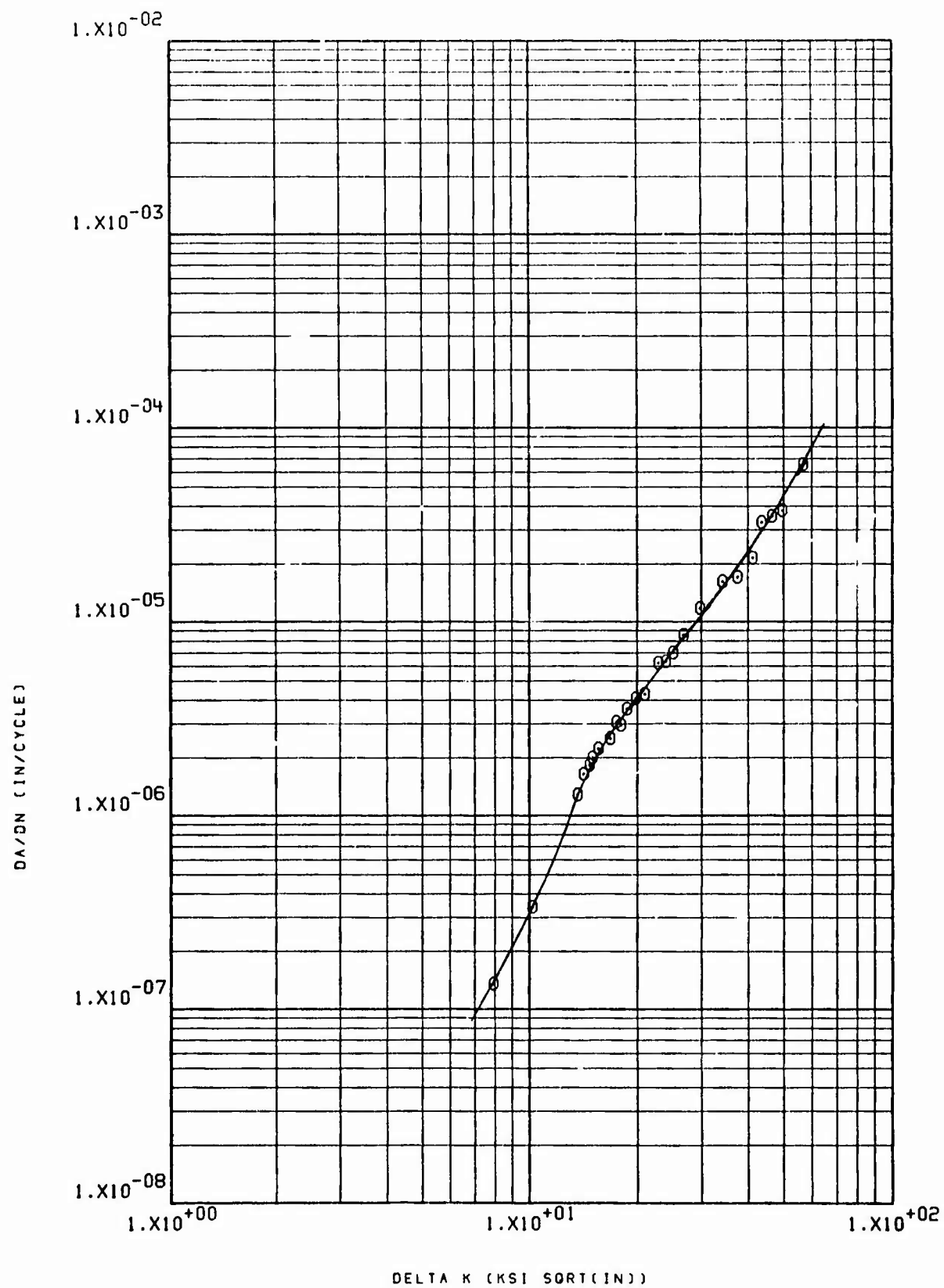


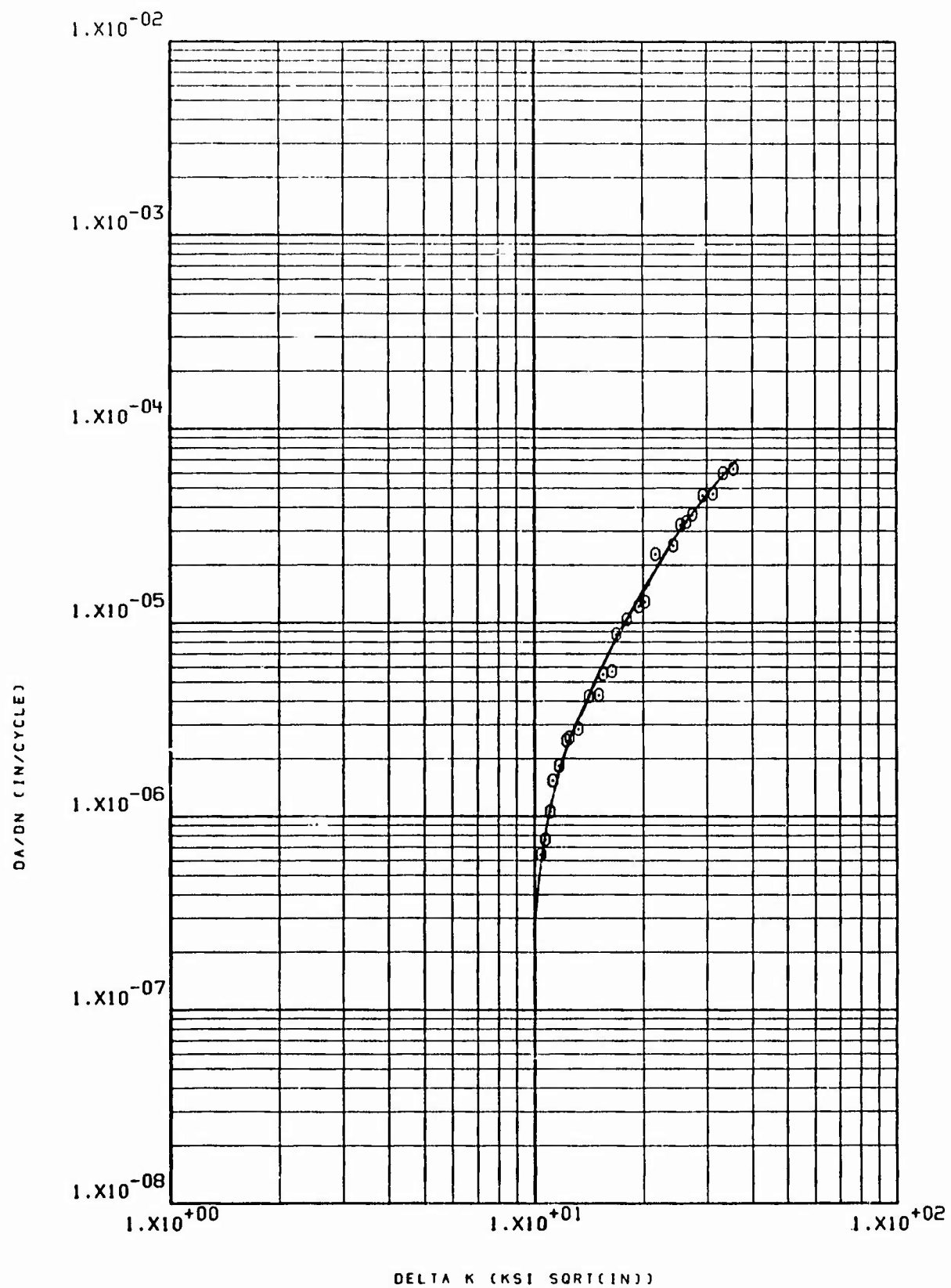
35 NWR 20-18 HP 9-4-.20 HT LHA R.T. 360CPM R=.08



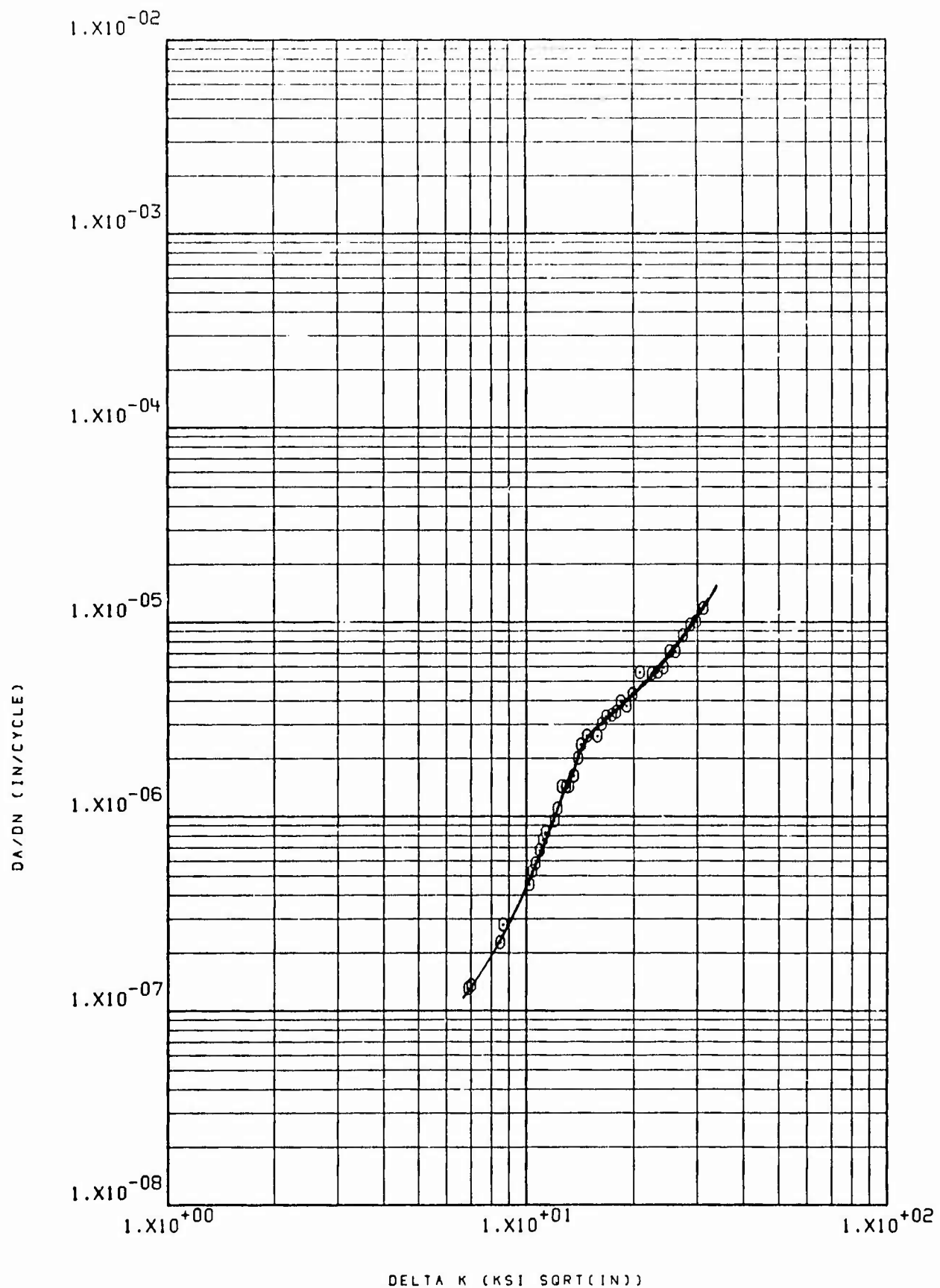
36 NRW 24-1 PH13-8 H1000 L.H.A.

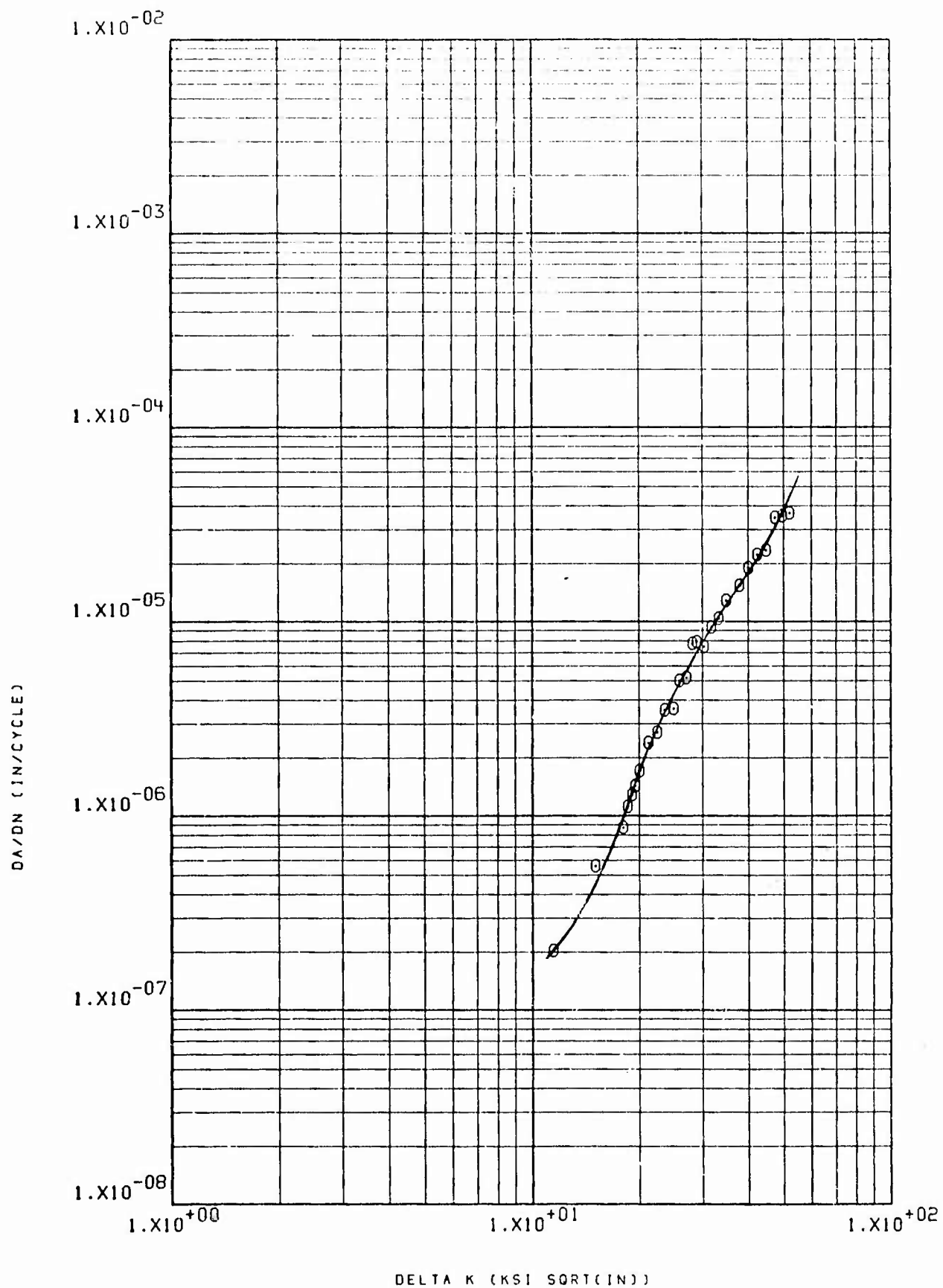
R.T. 360CPM R=.08

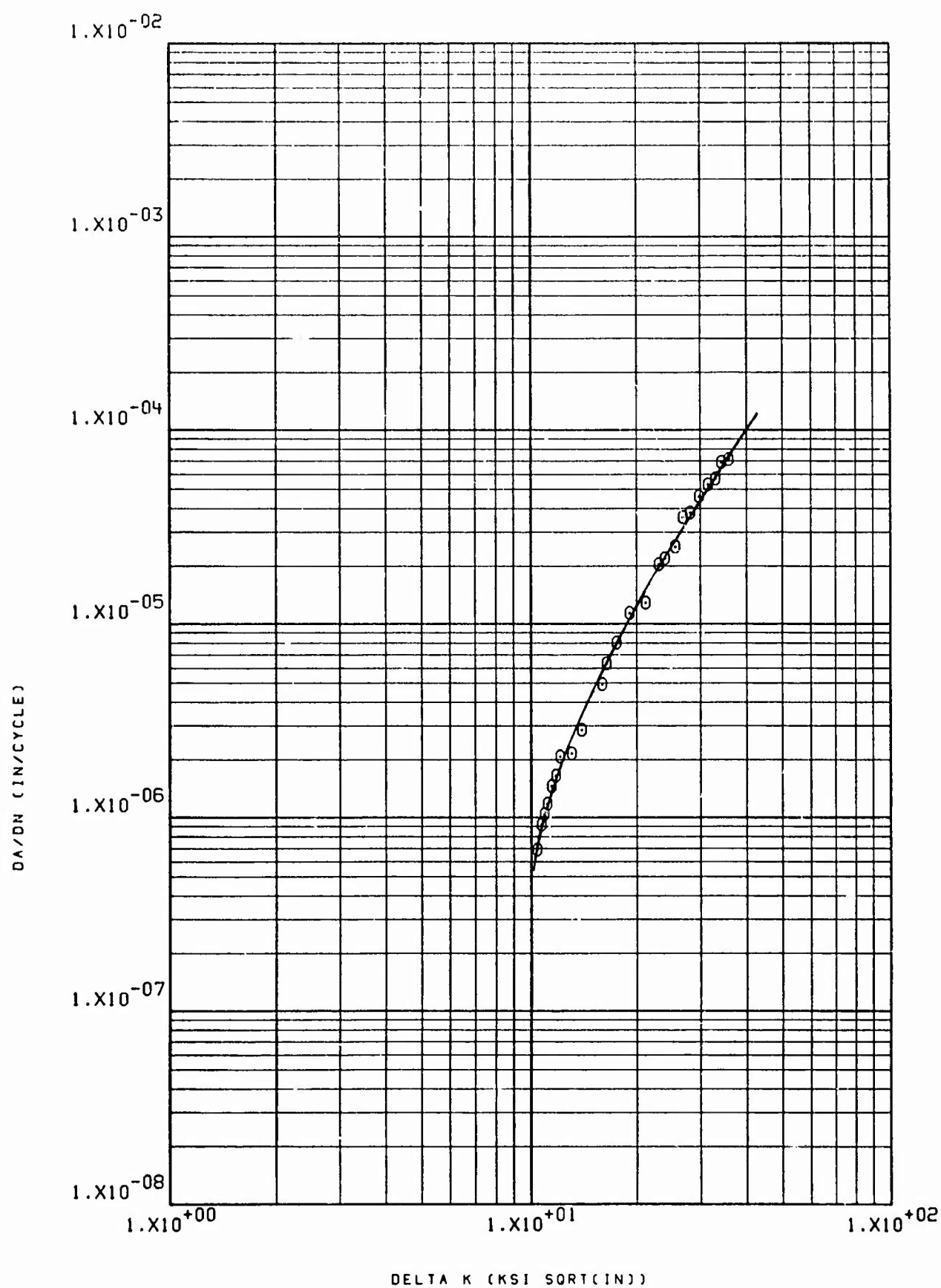


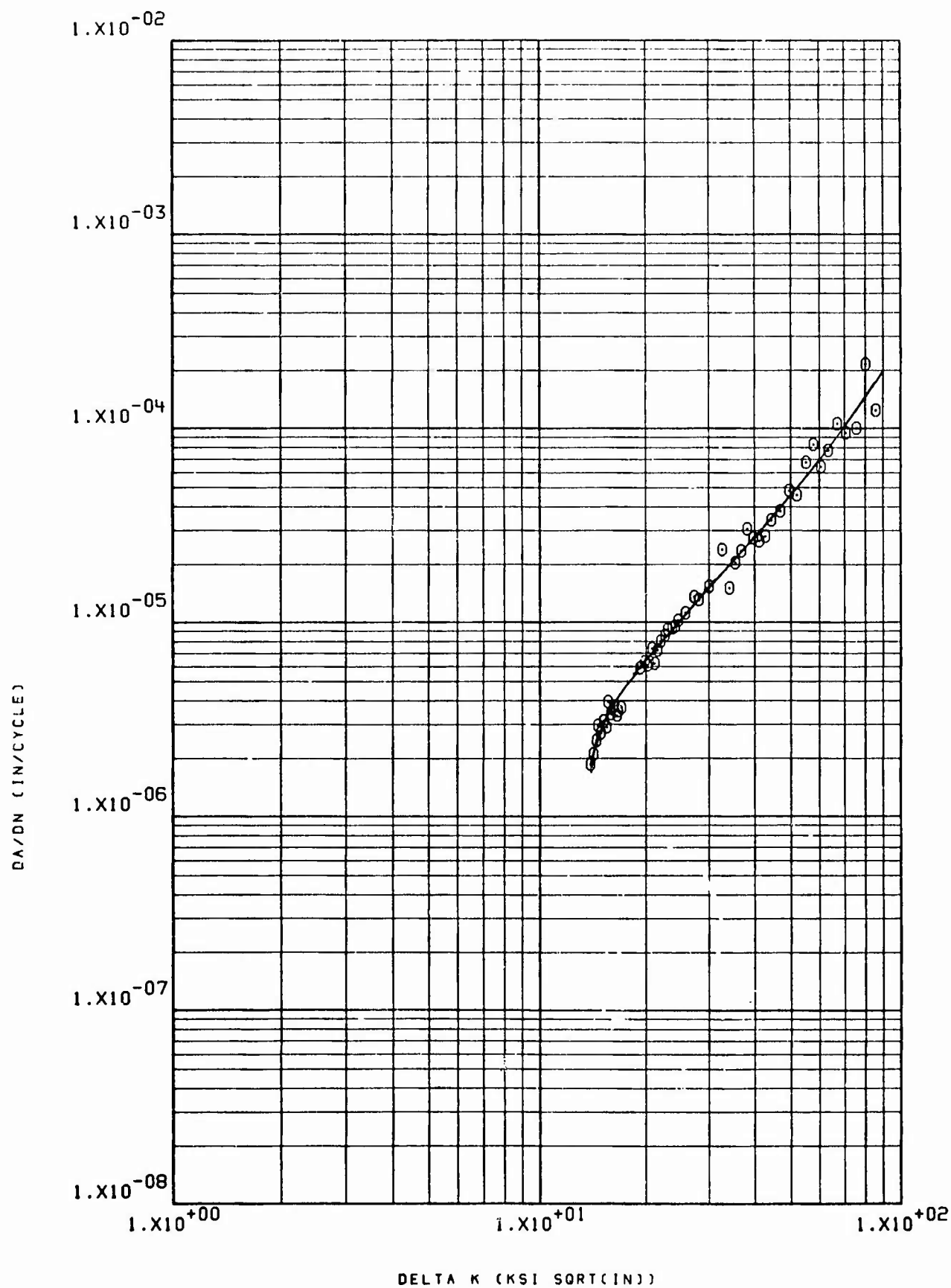


36 NRW 24-3 PH13-8 H1000 SUMP R.T. 60CPH R=.08



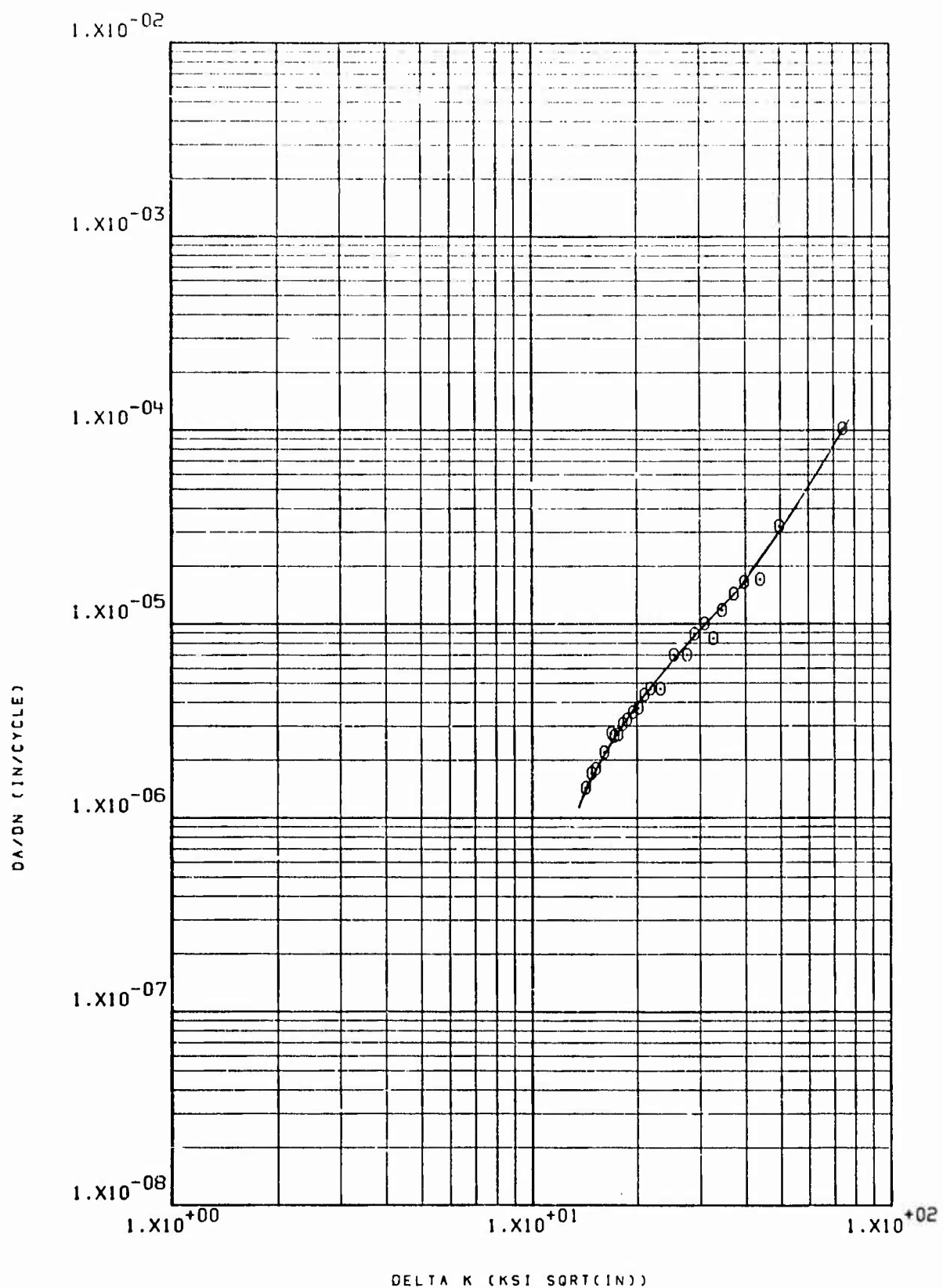




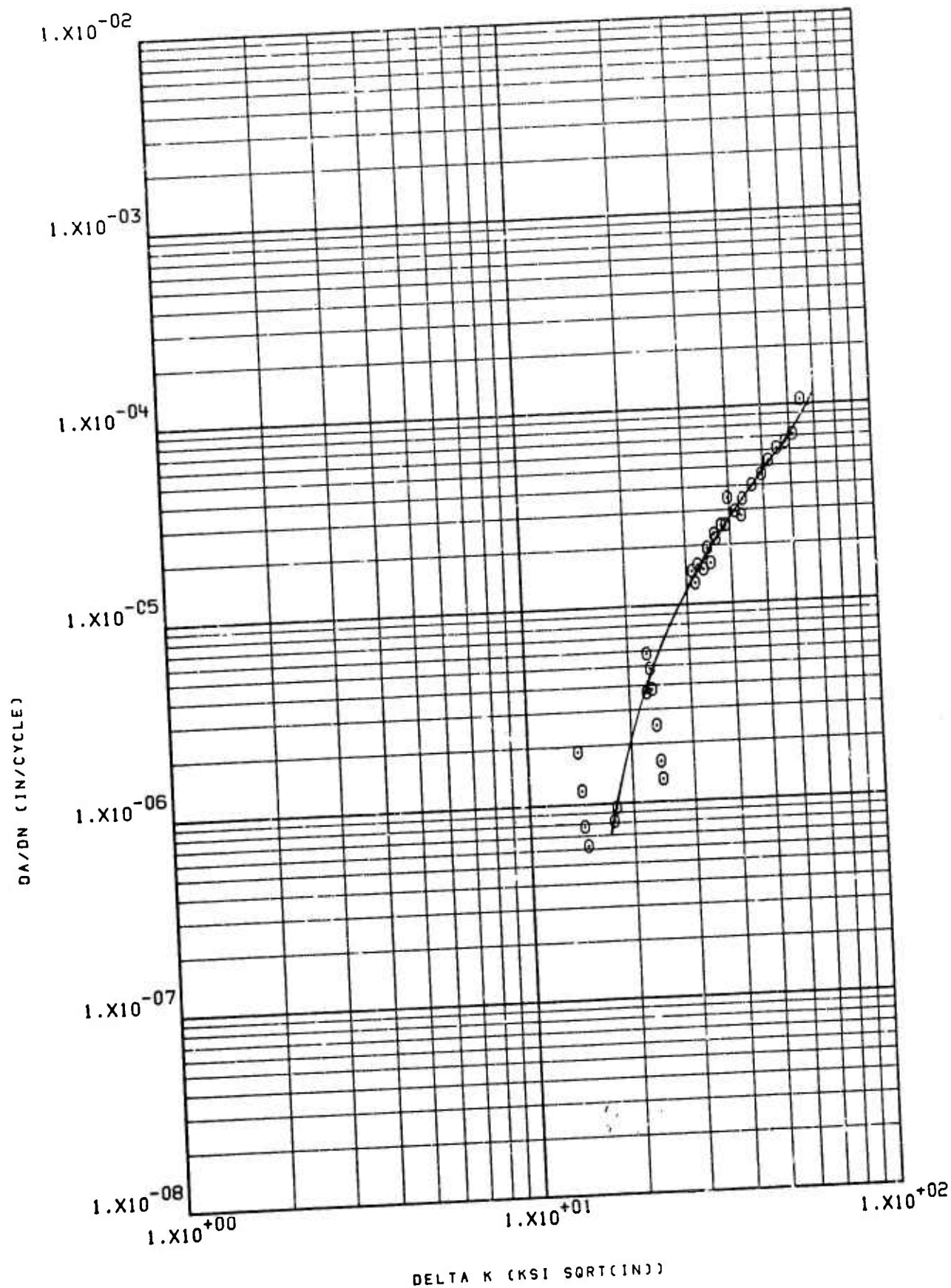


37 NRW 30-2 HP- 9-4-.20 H.T. 100% HUMIDITY RT R=0.08 6CPM

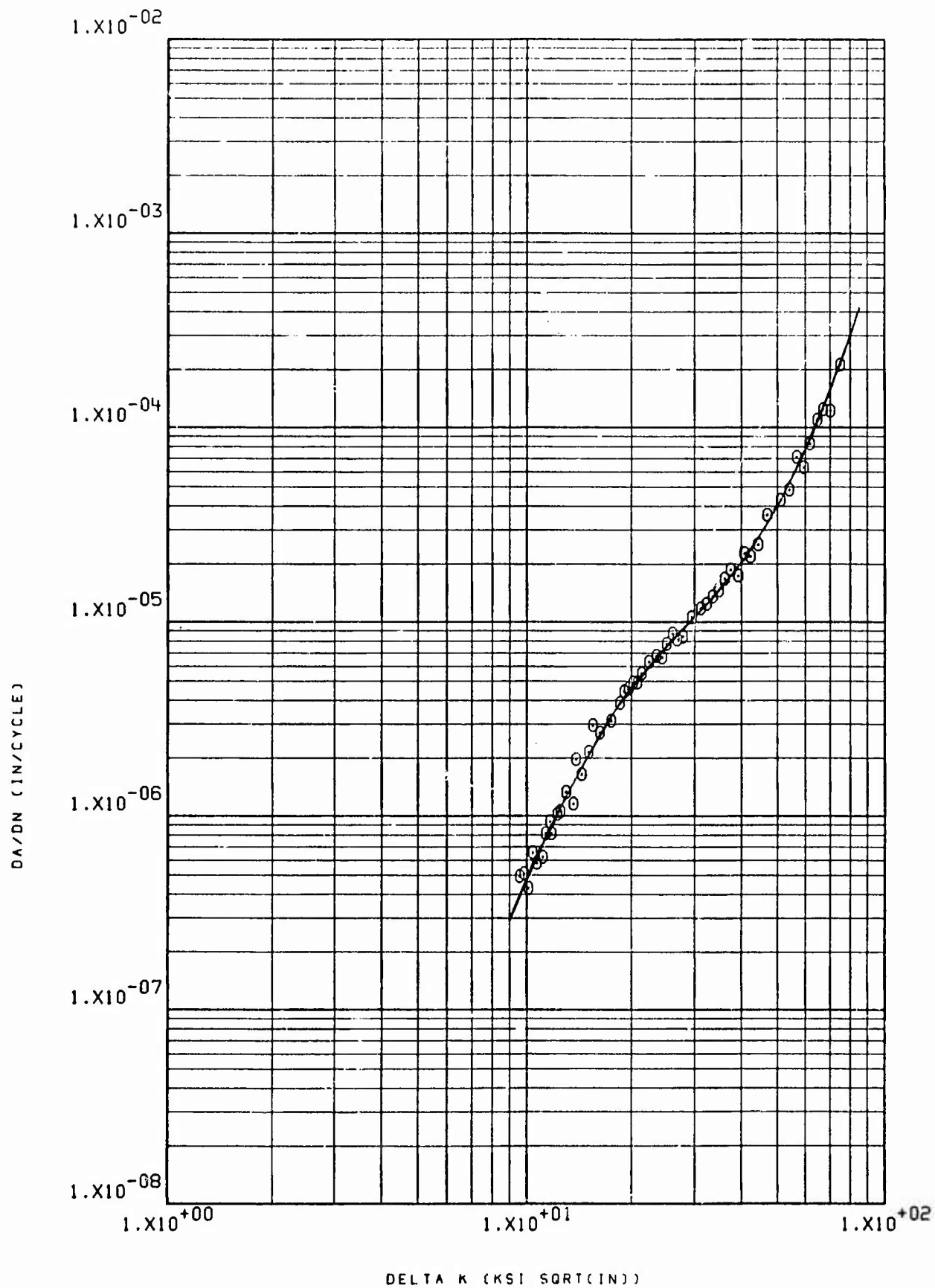
C-39



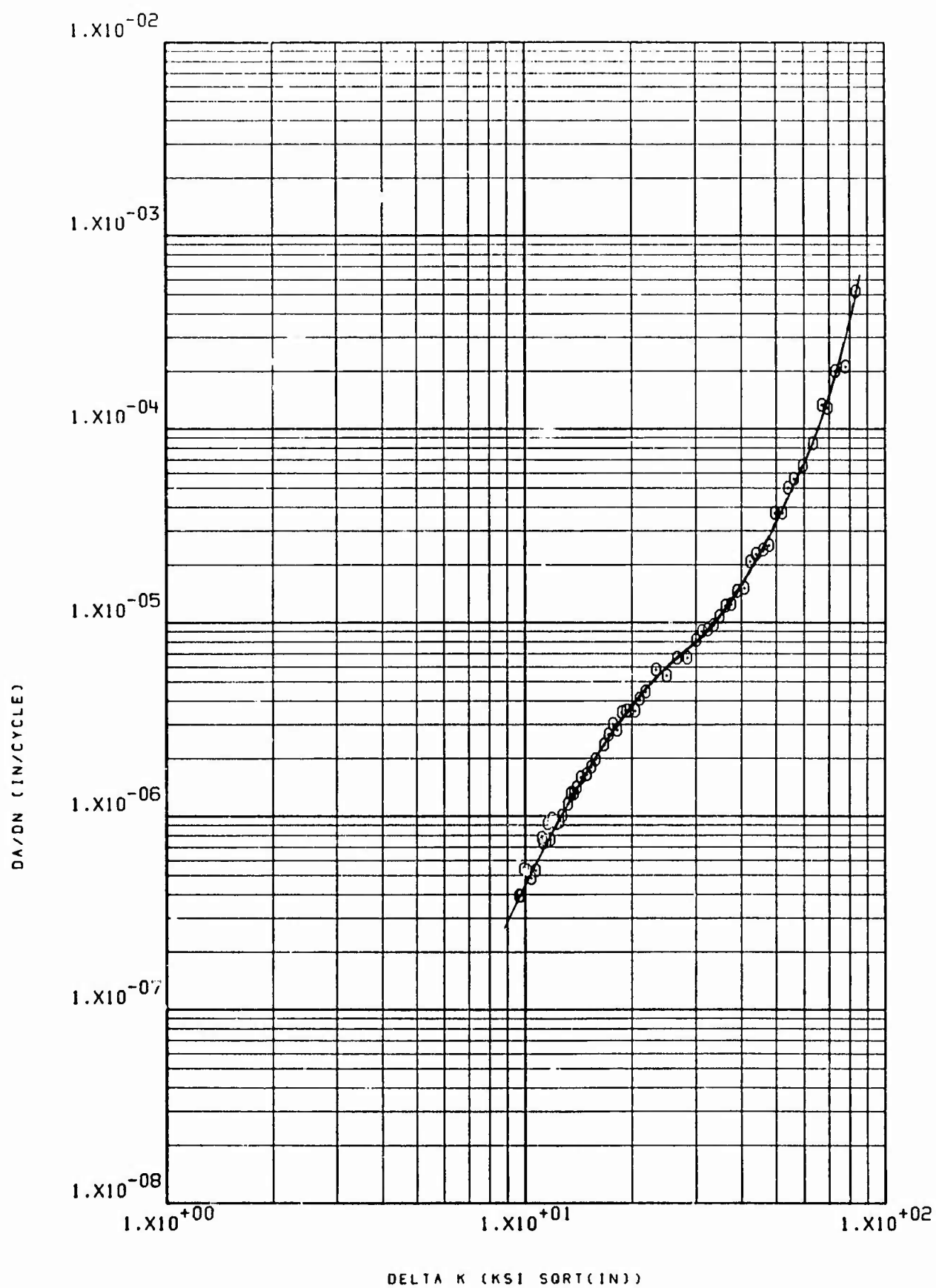
37 NRW 30-3 9-4-20 HT LHA RT R=.08 360CPH



37 NRW 30-4 HP-9-4-.20 H.T. STW RT R=0.08 6CPM C-41

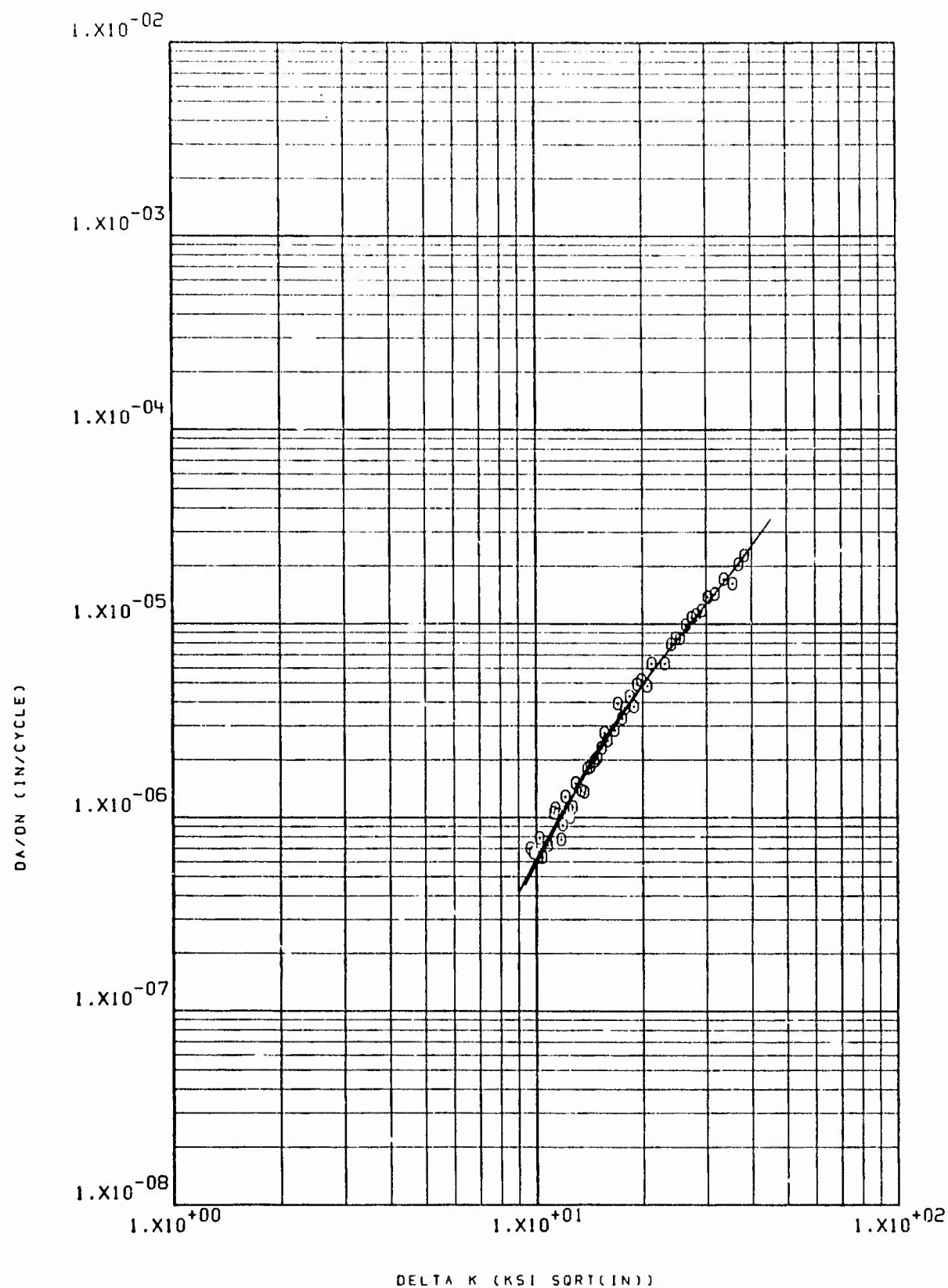


37 NRW 30-7 HP 9-4-.20 HT L.H.A. R.T. 360CPM R=.08

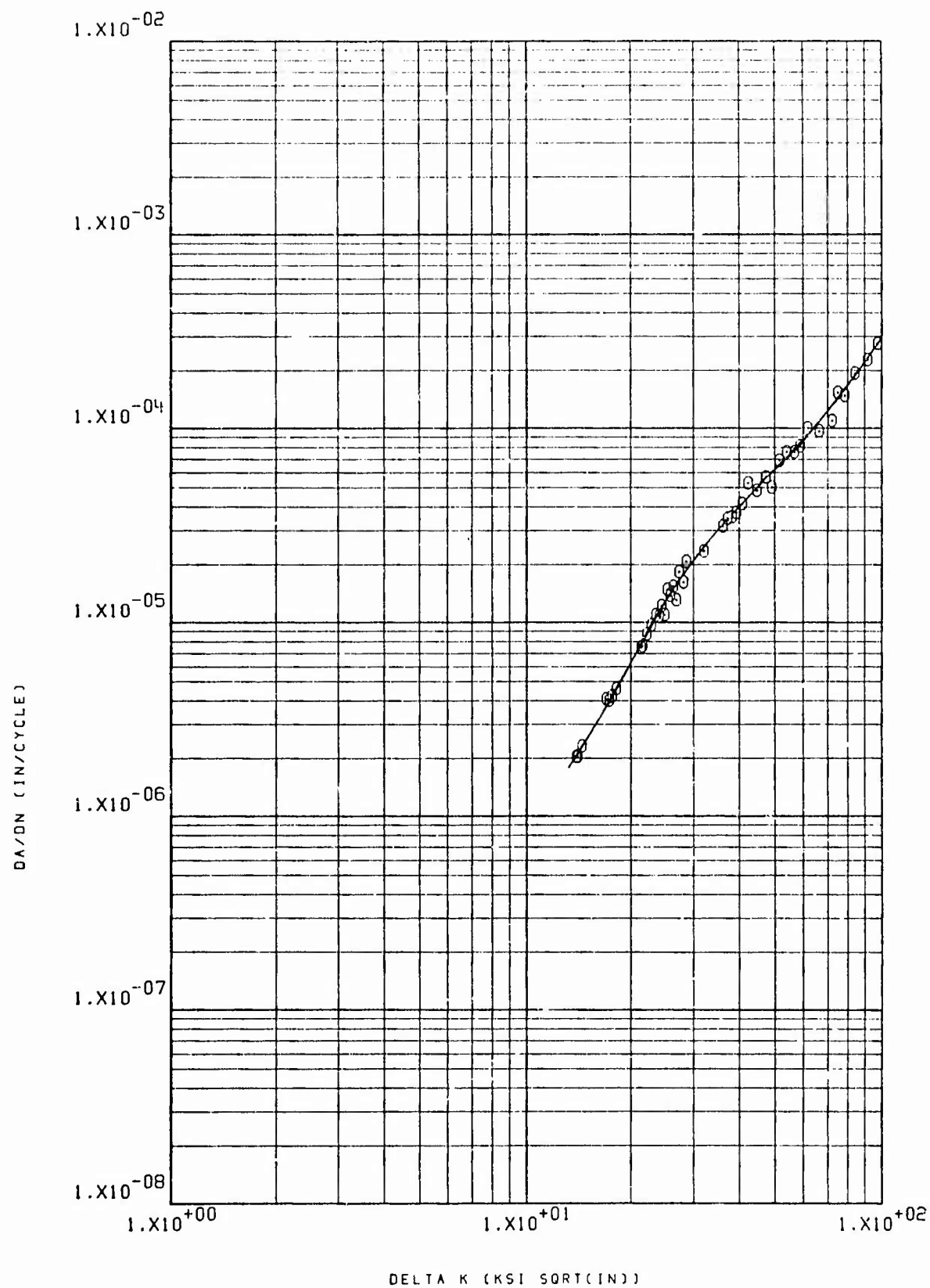


37 NRW 30-8 HP 9-4-.20 HT L.H.A. -65F 60CPM R=.08

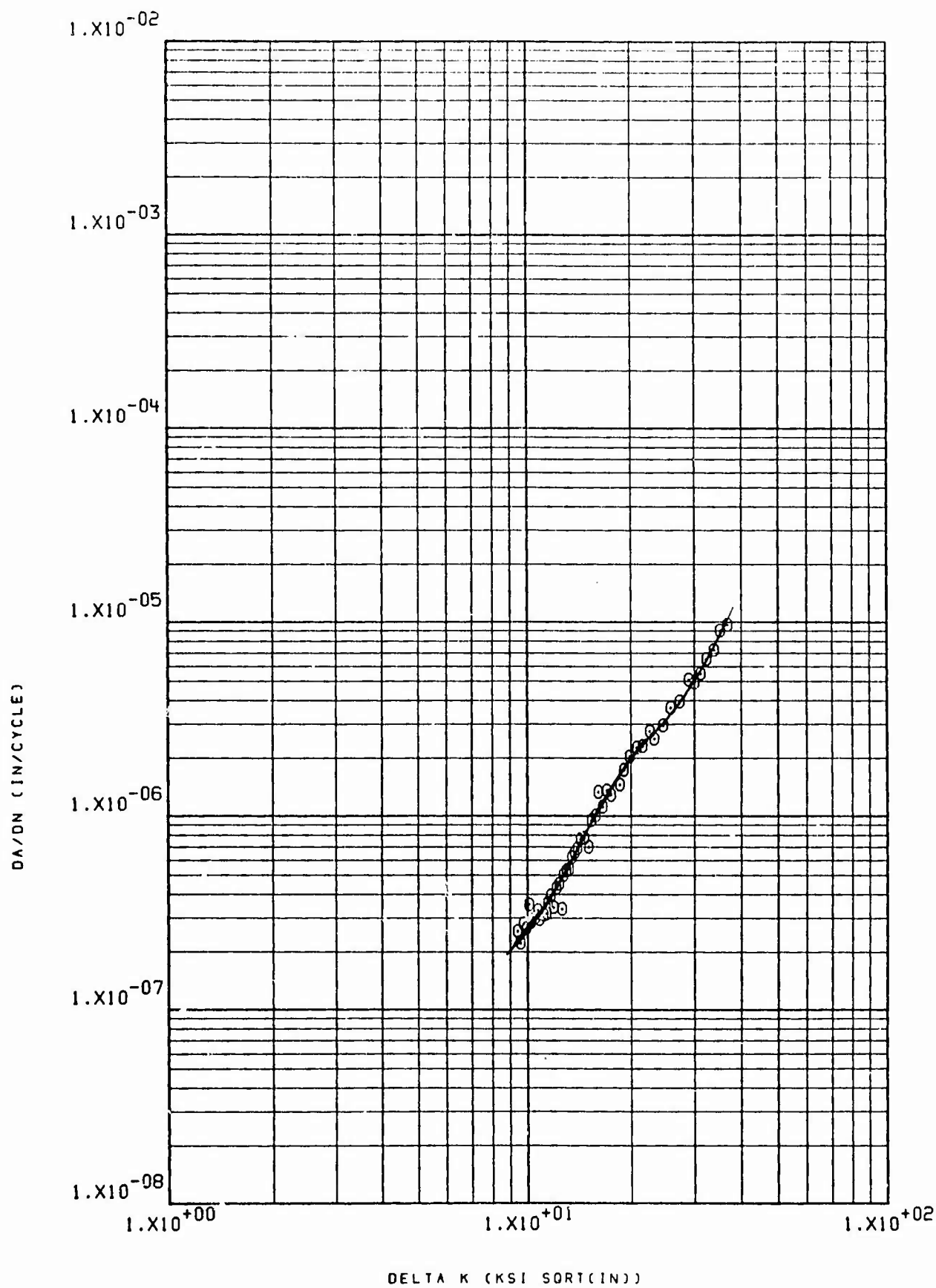
C-43



37 NRW 30-9 HP 9-4-.20 HT 1000 HUMIDITY R.T. 60CPM R=.08

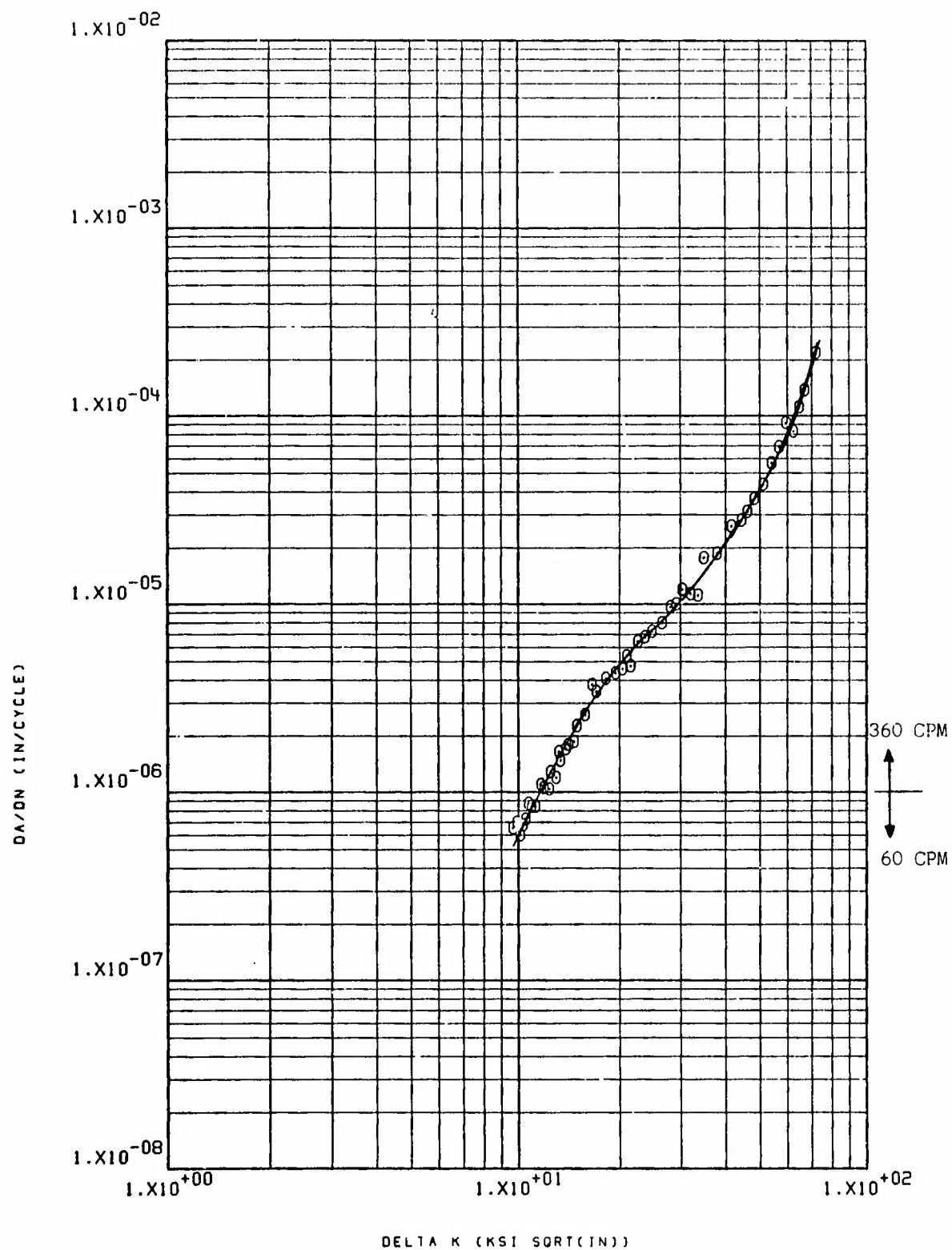


37 NRV 30-12 9-4-20 HT DIST WATER RT R=.08 6CPM

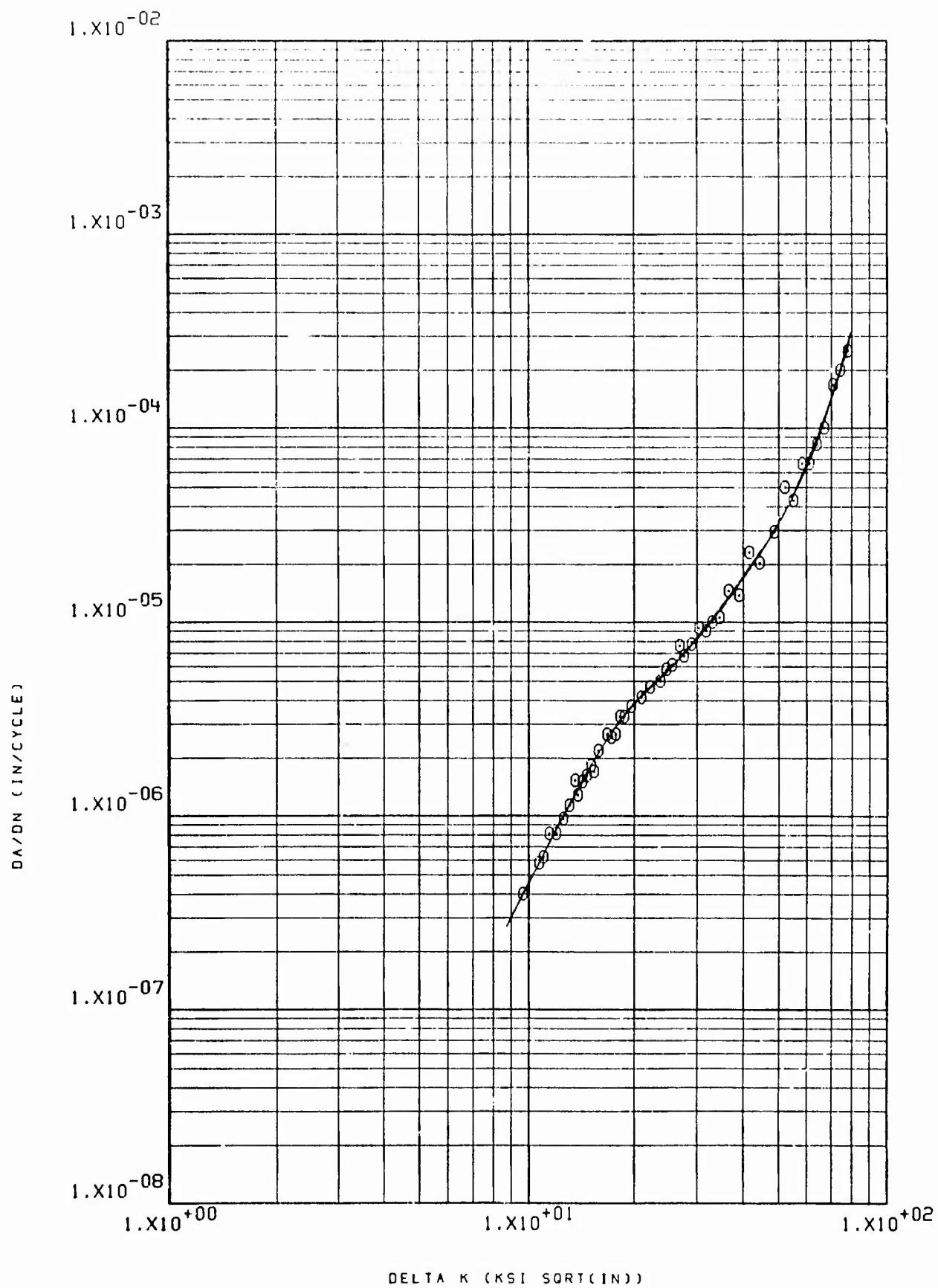


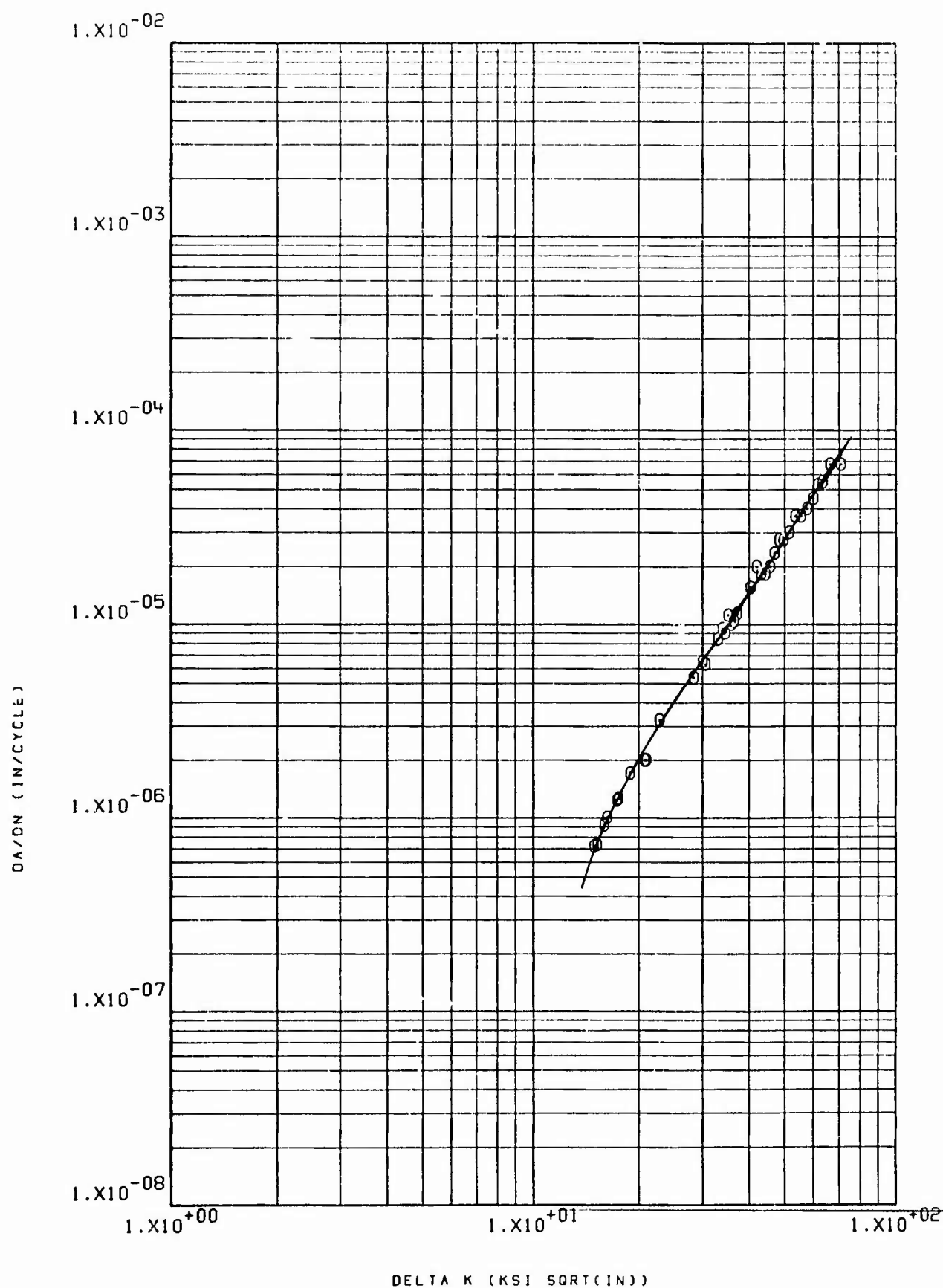
37 NRW 30-13 9-4-20 HT LHA RT R=.08 360CPM

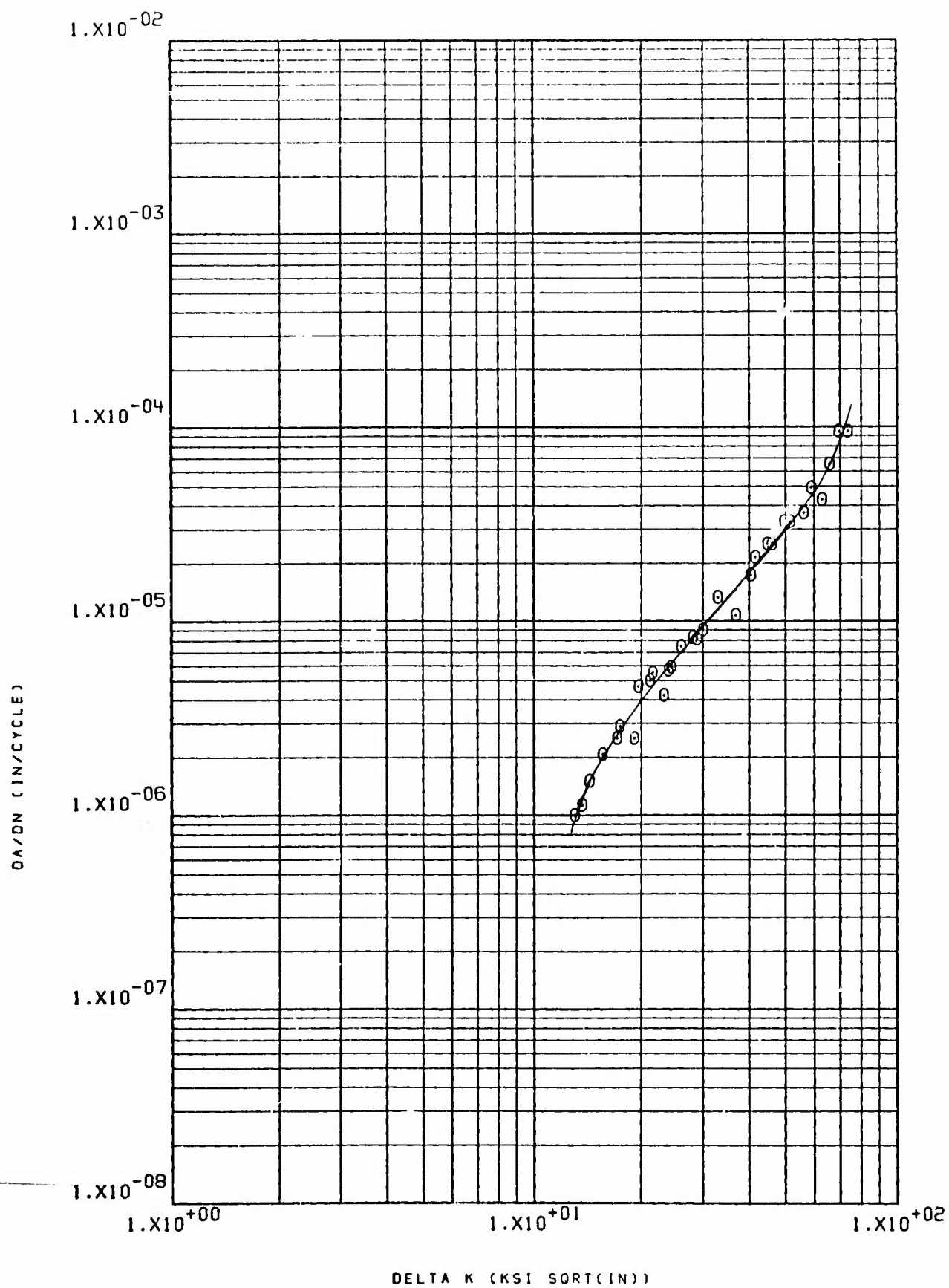
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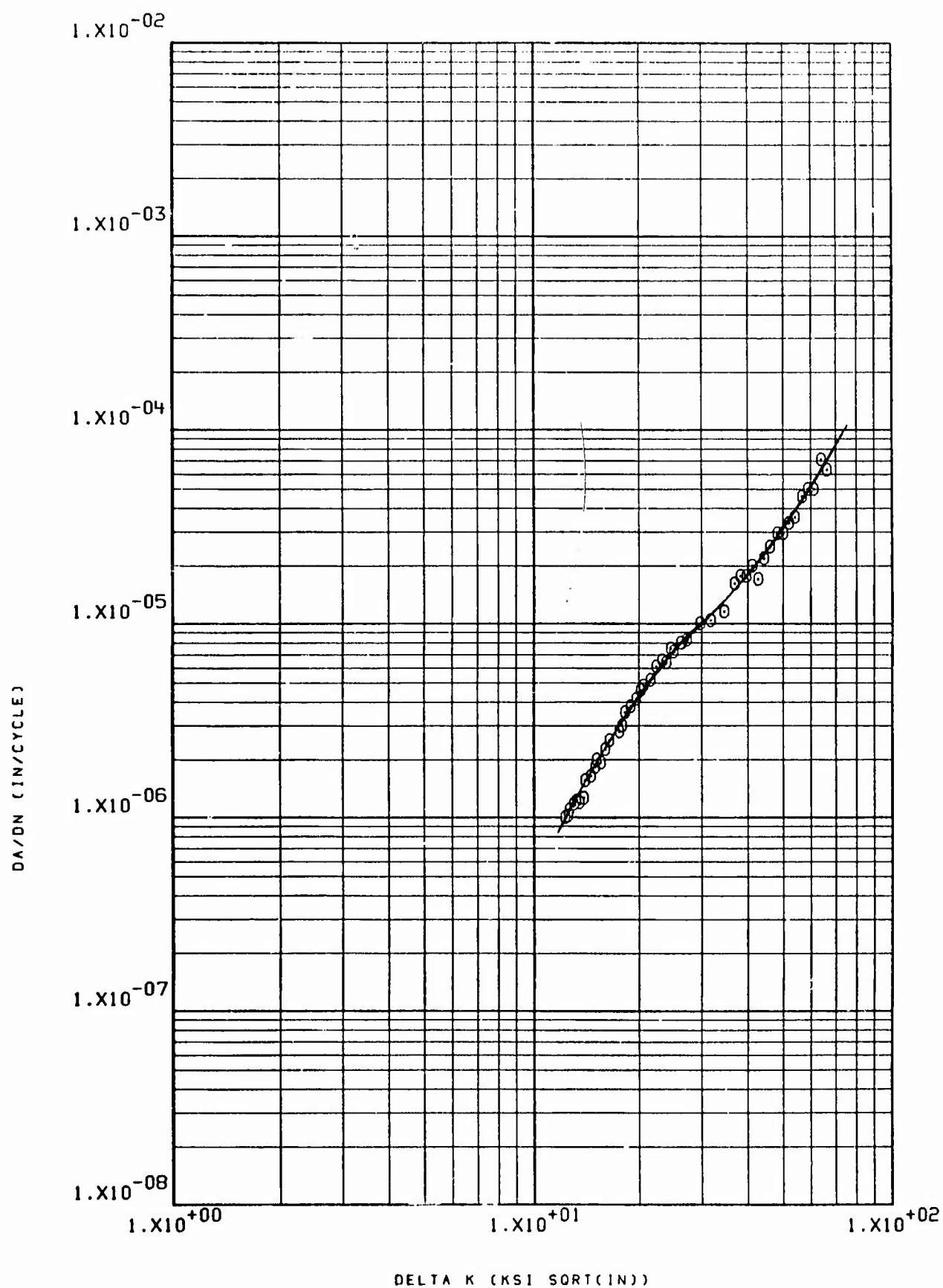


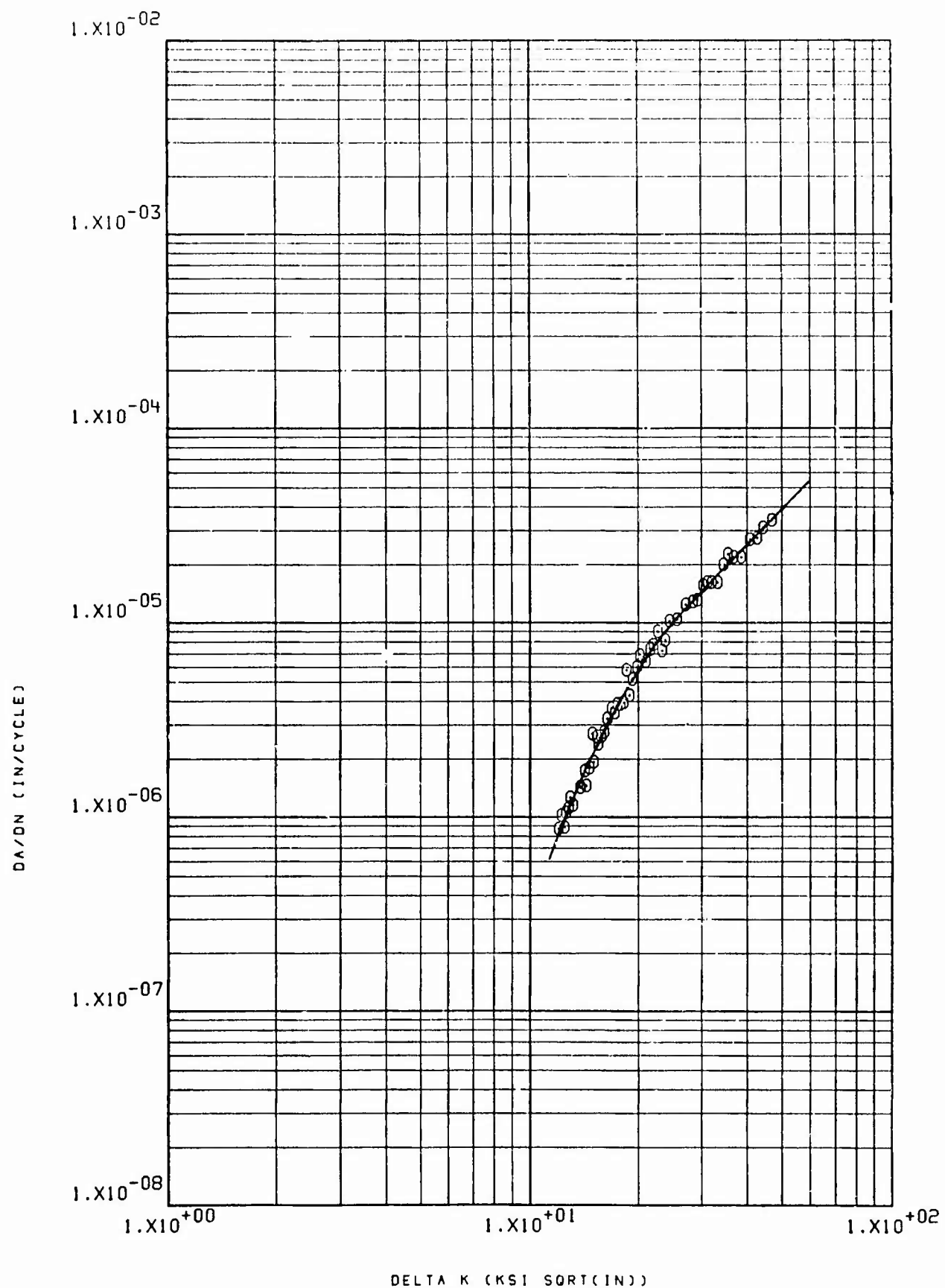
37 NWR 30-14 HP 9-4-.20 HT L.H.A. R.T. R=.08 60 & 360 CPM
C-47



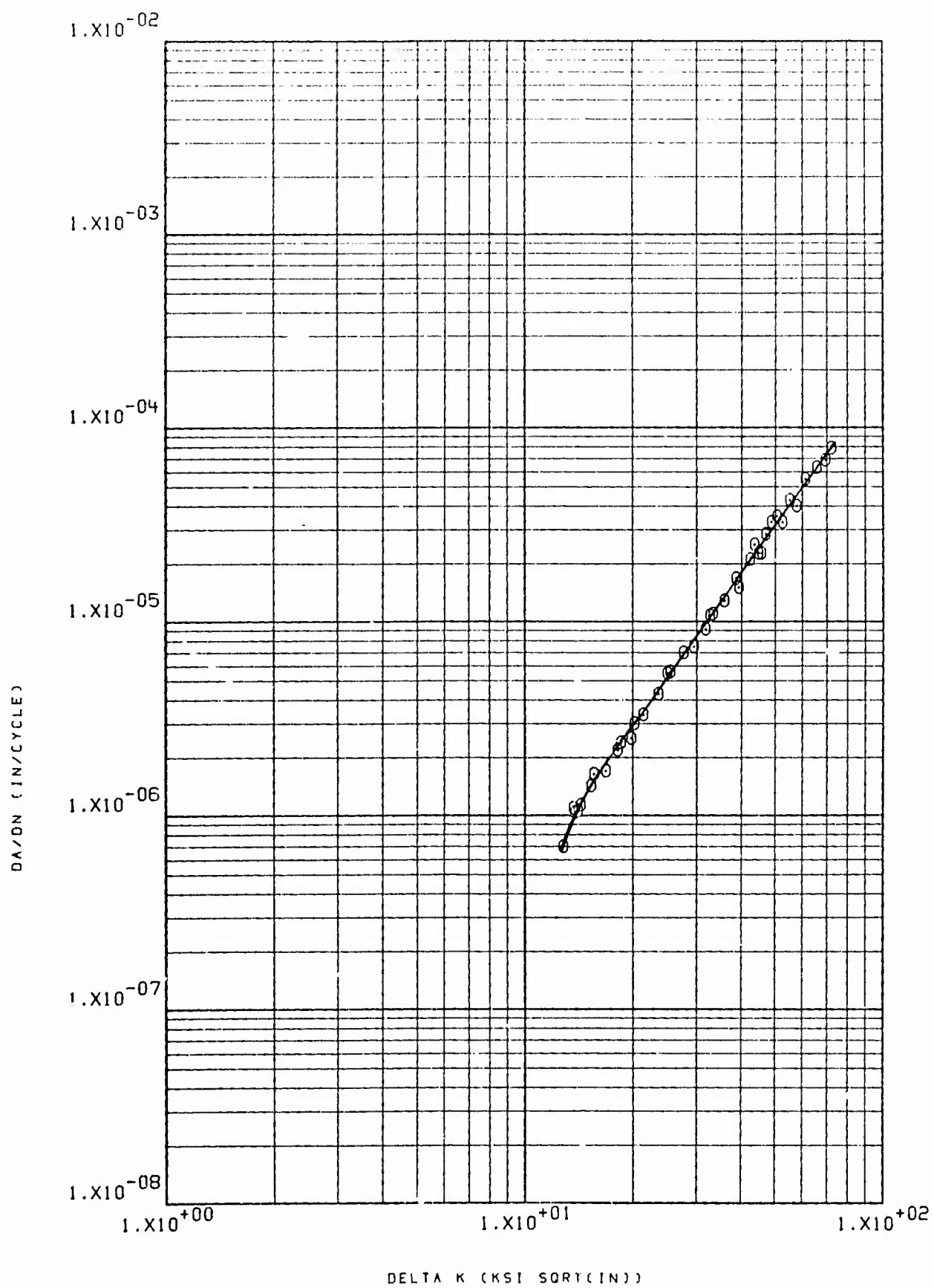


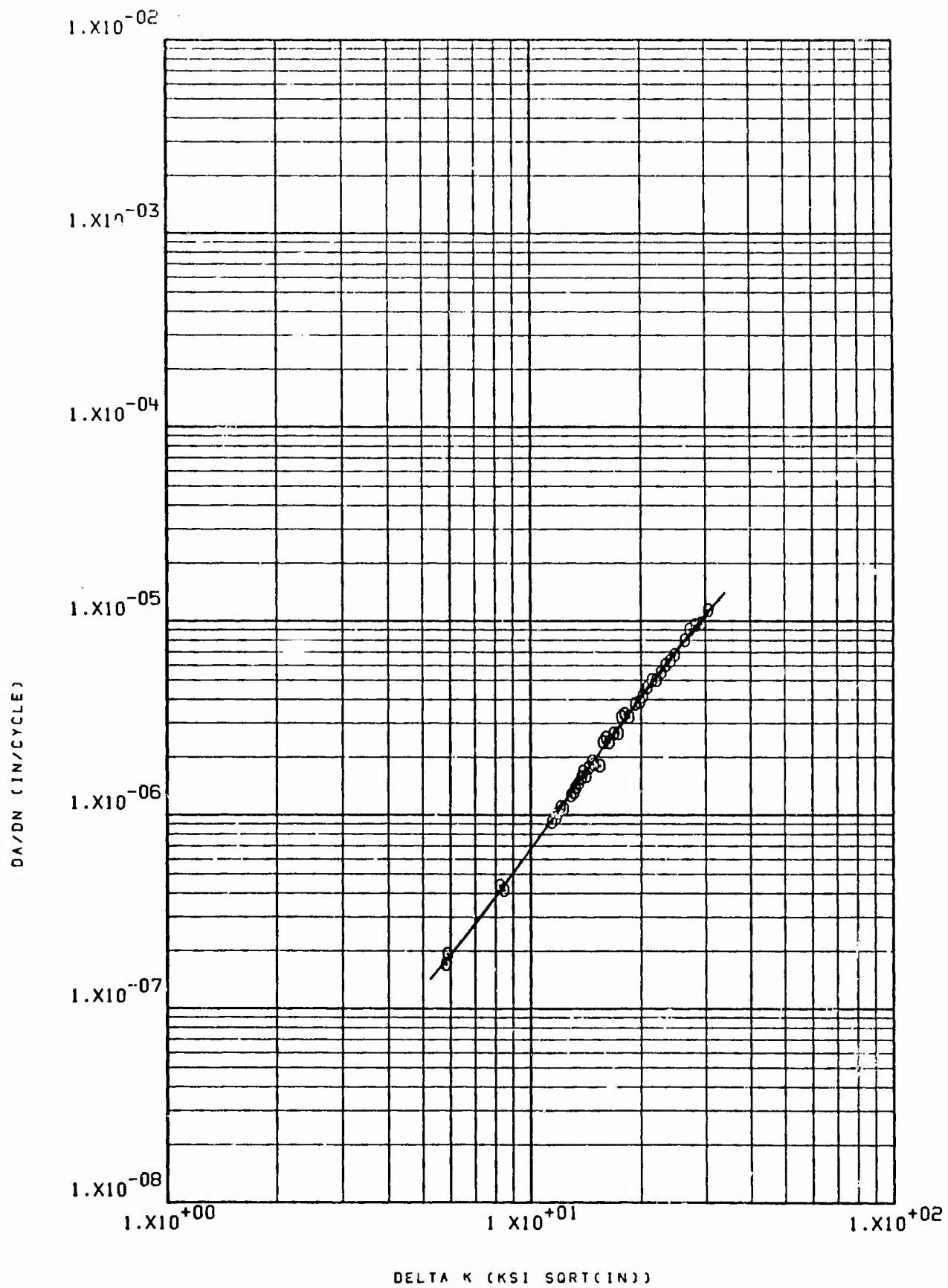






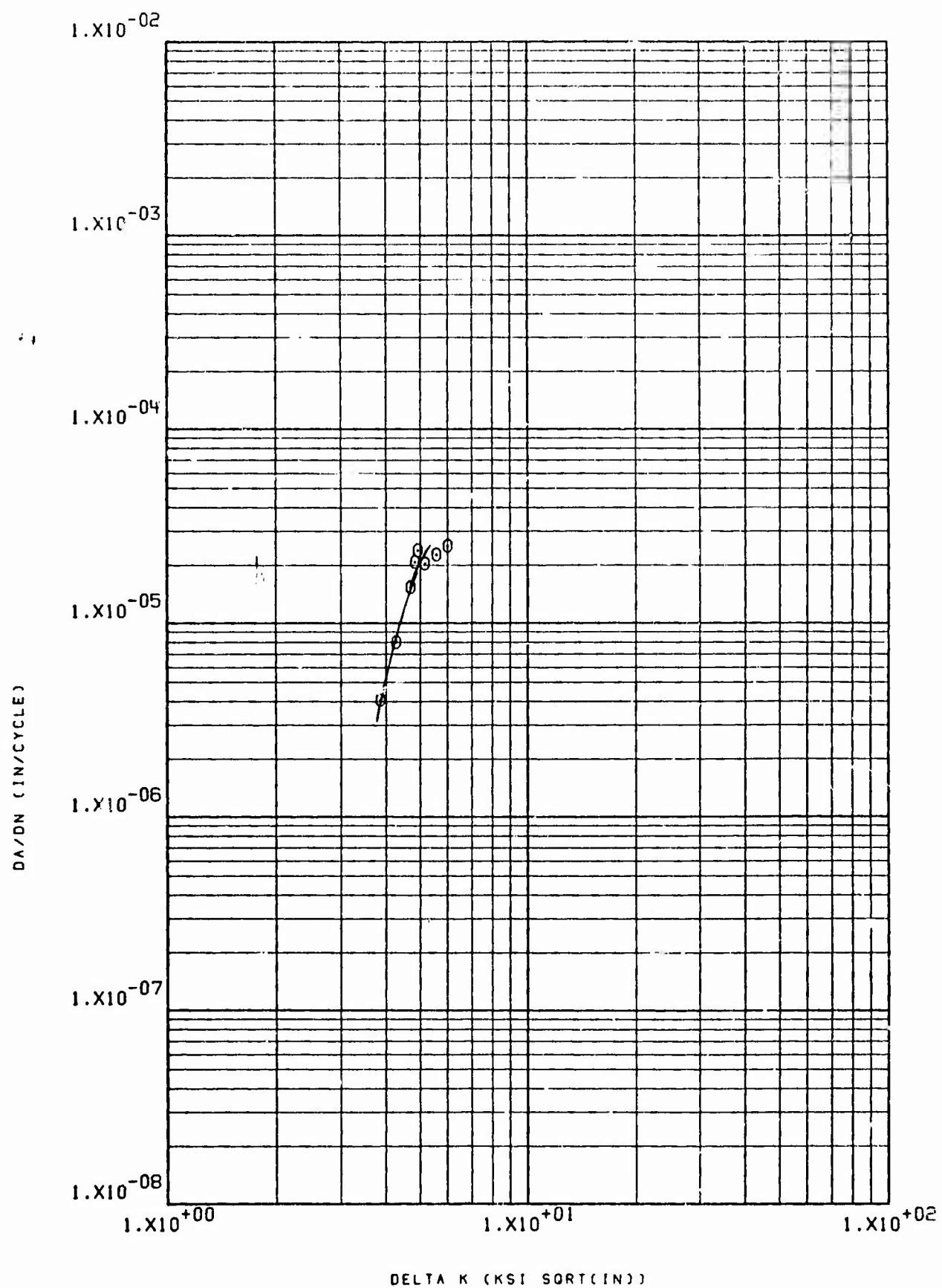
37 NRW 31-6 HP 9-4-.20 HT STW R.T. 60CPH R=.08

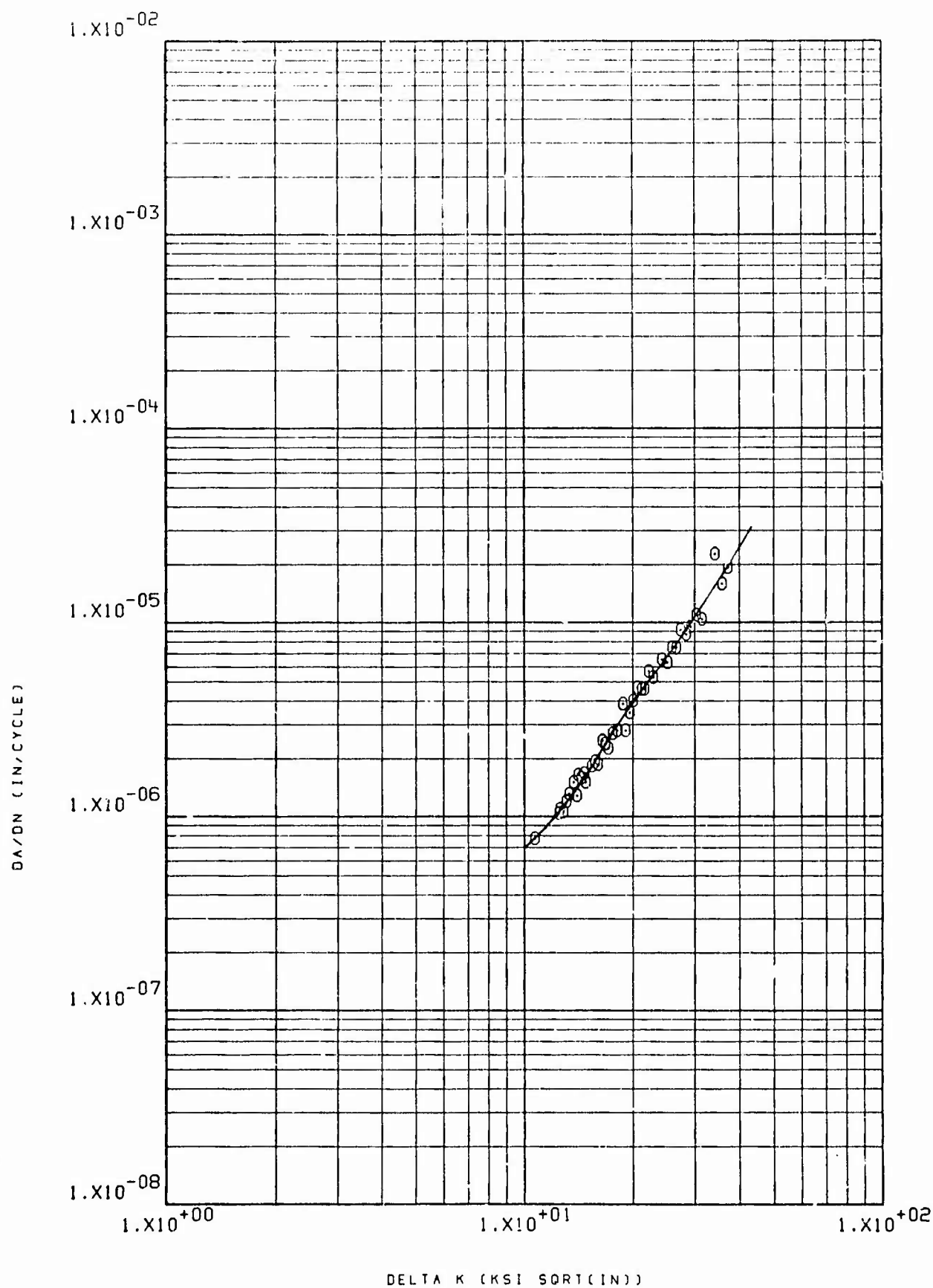


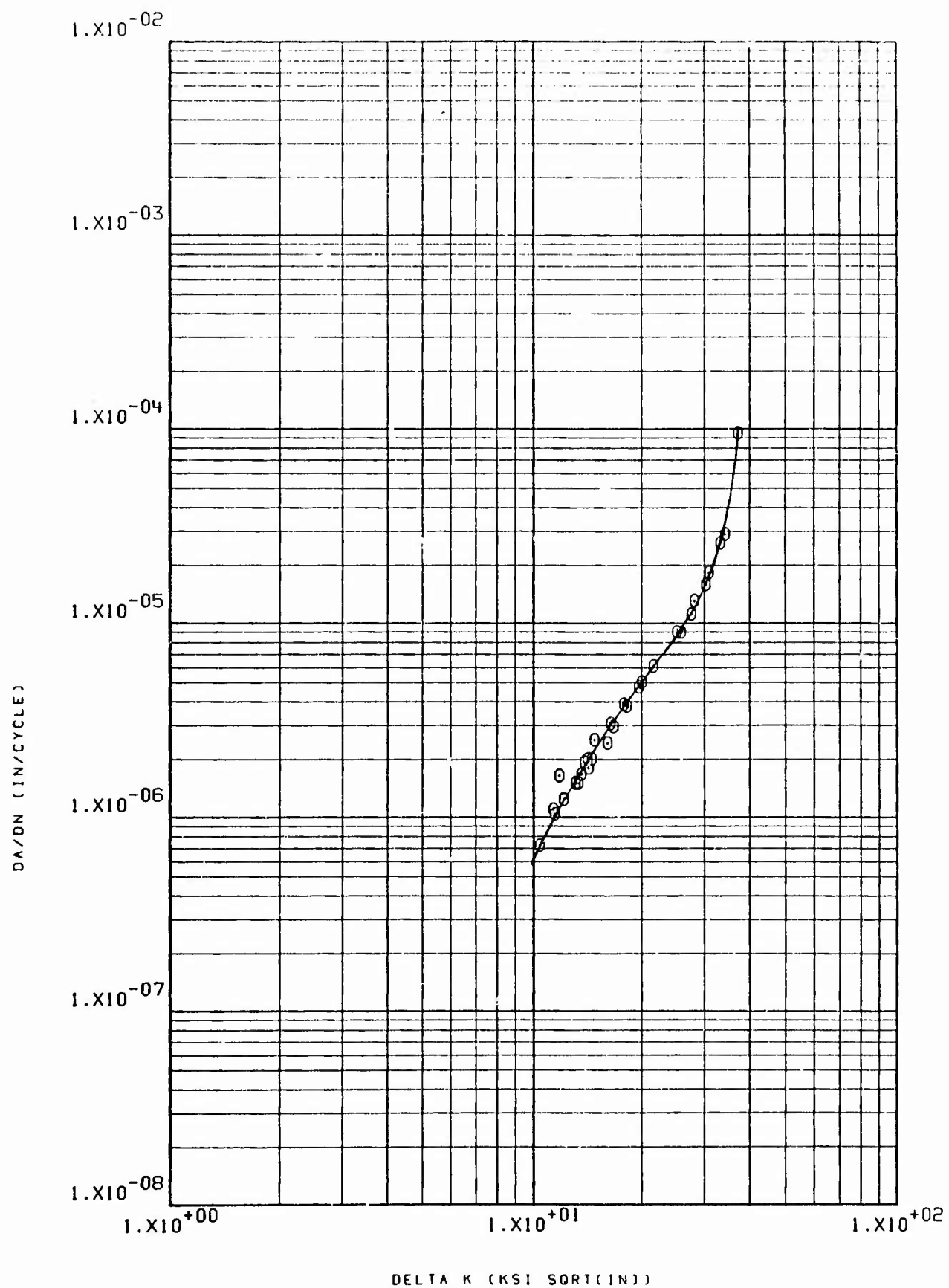


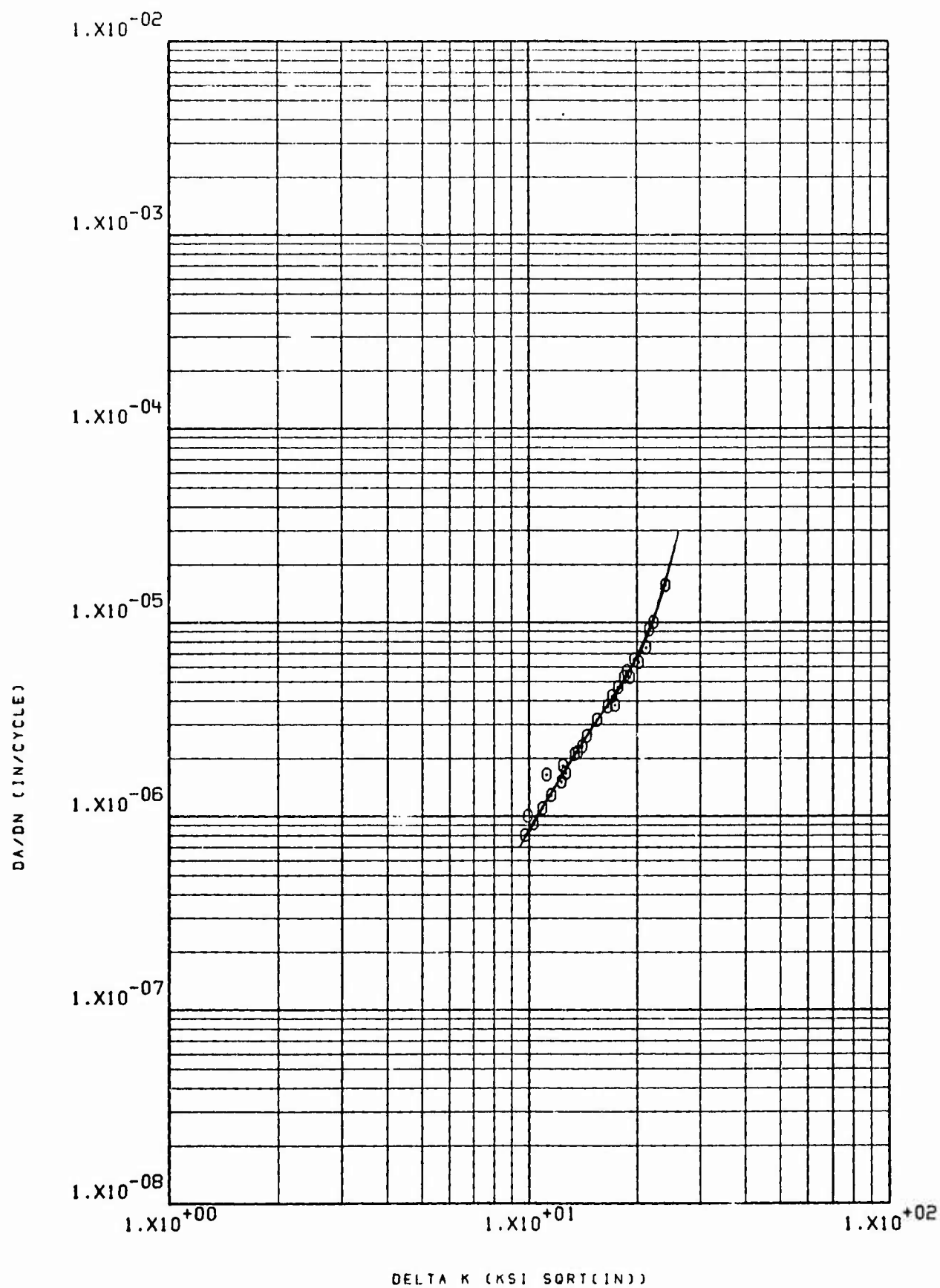
39 NRW 55-7 300M HT 360 CPM LHA RT R=.08

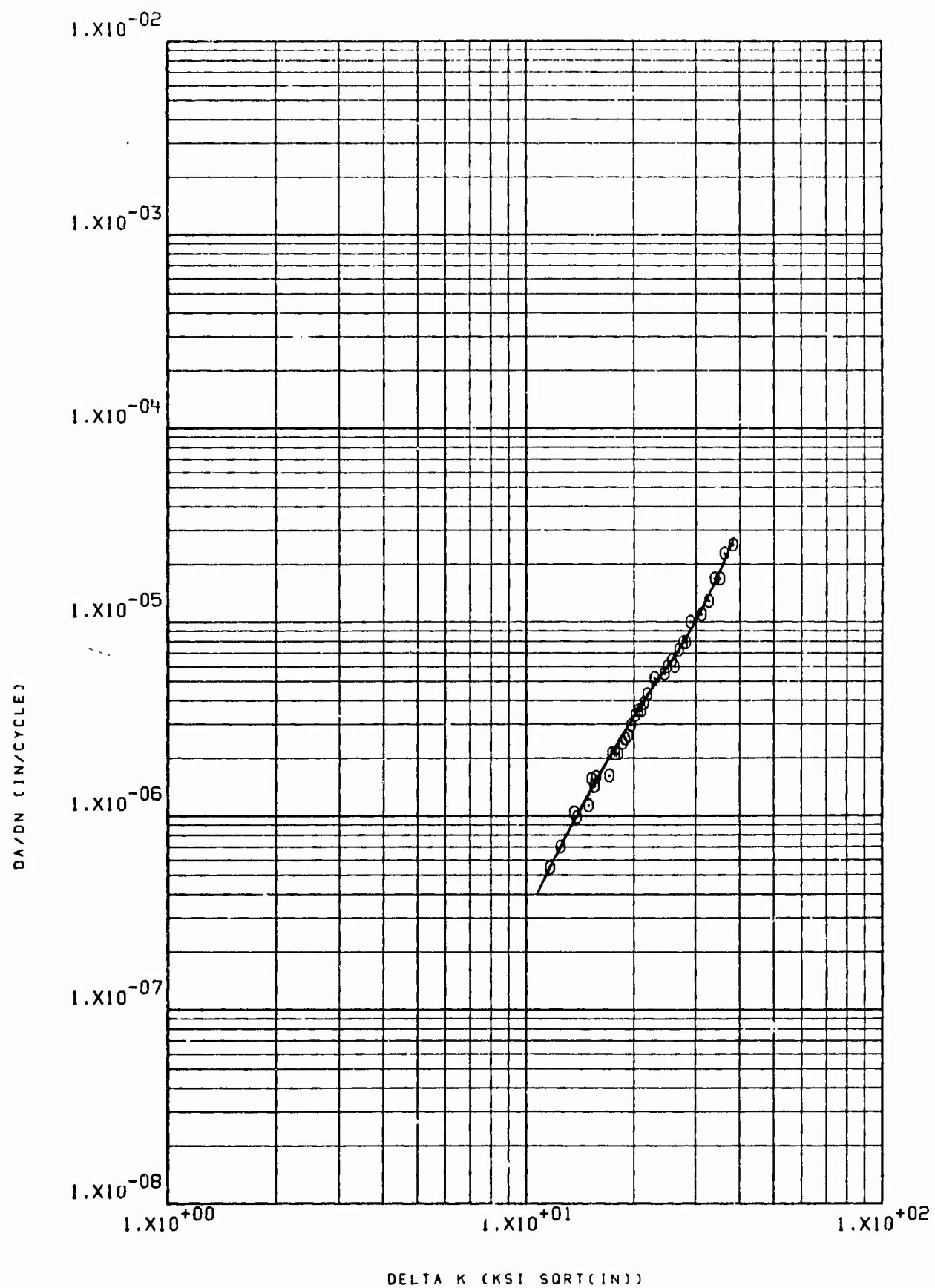
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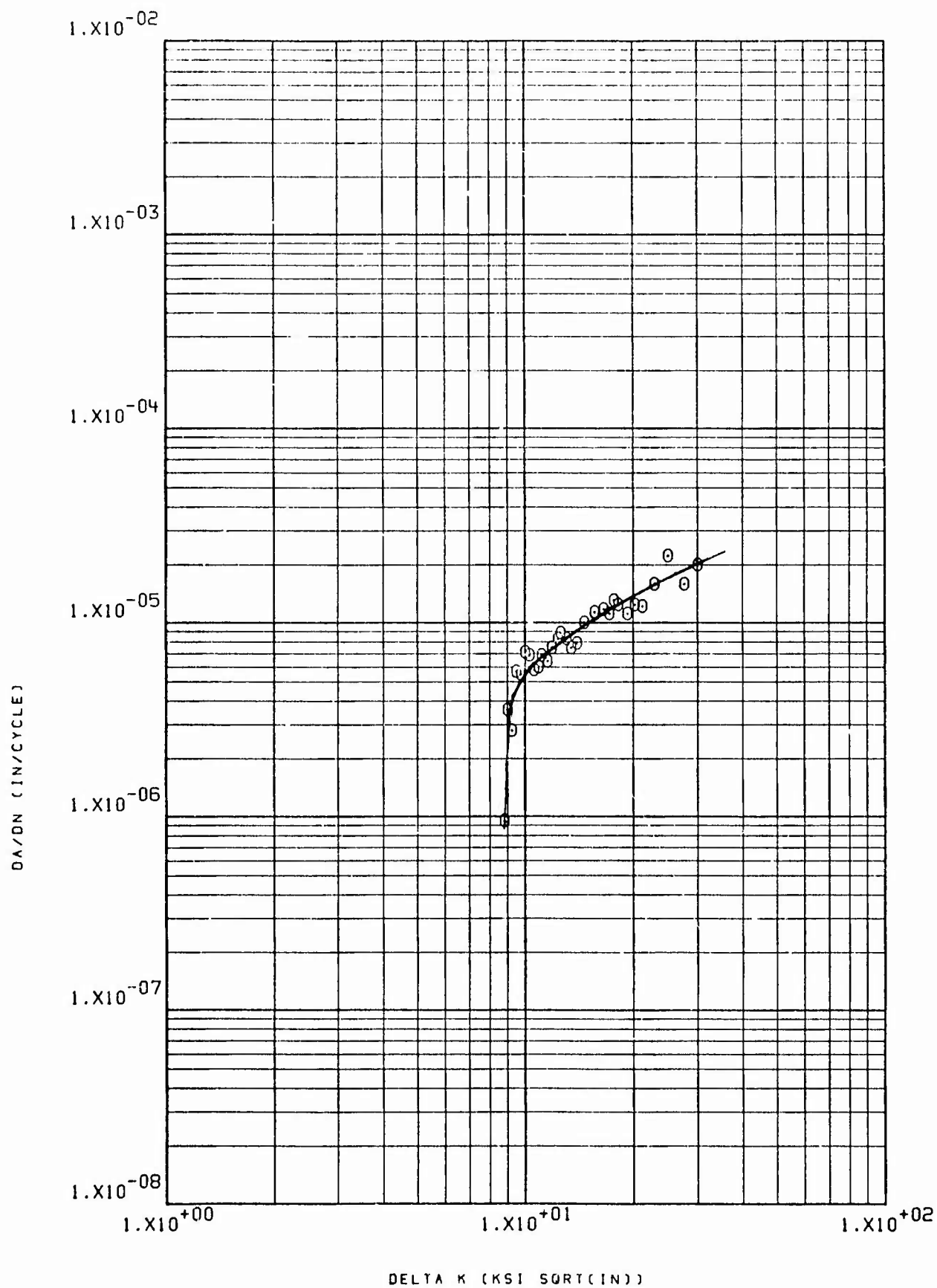


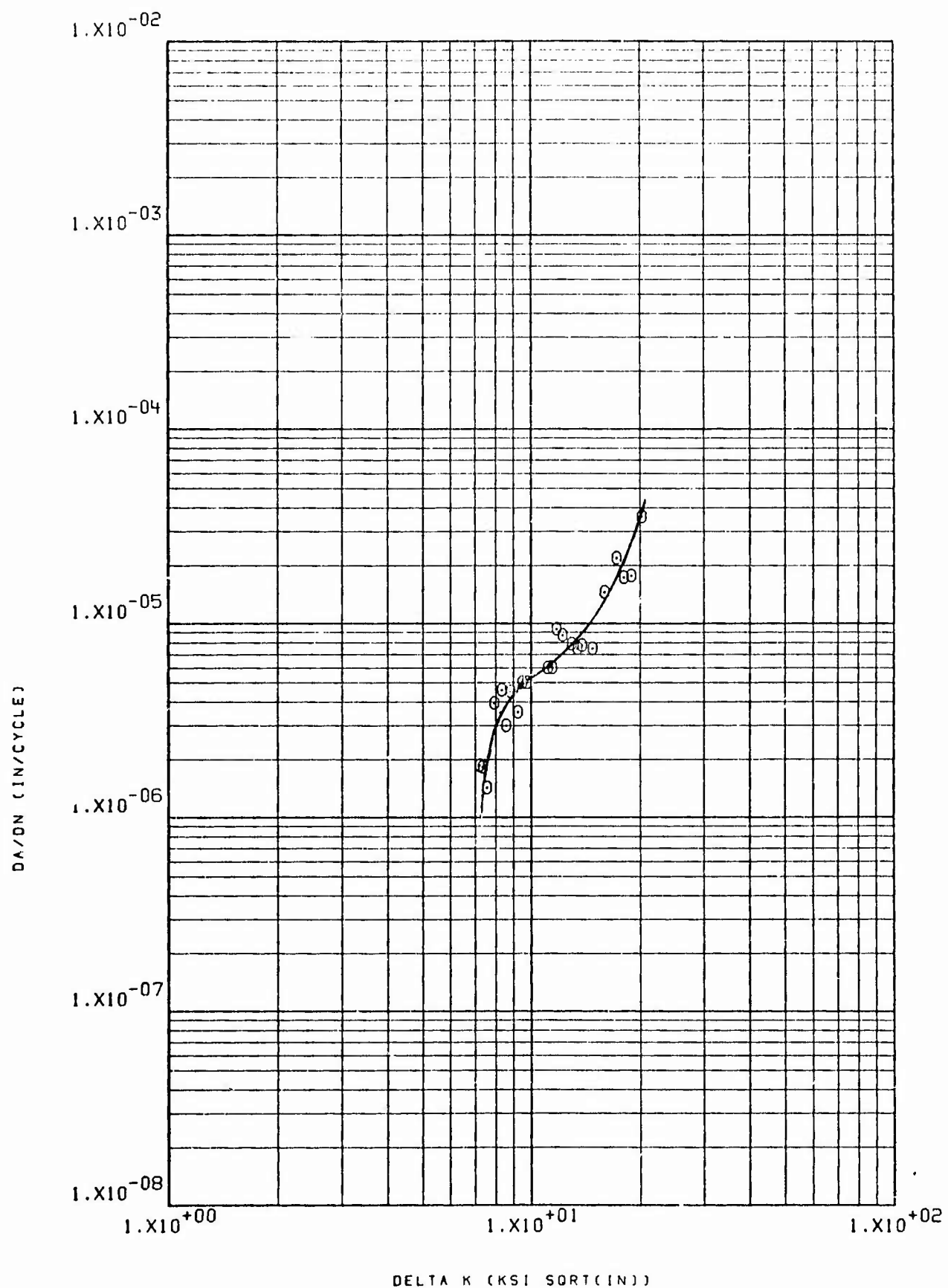


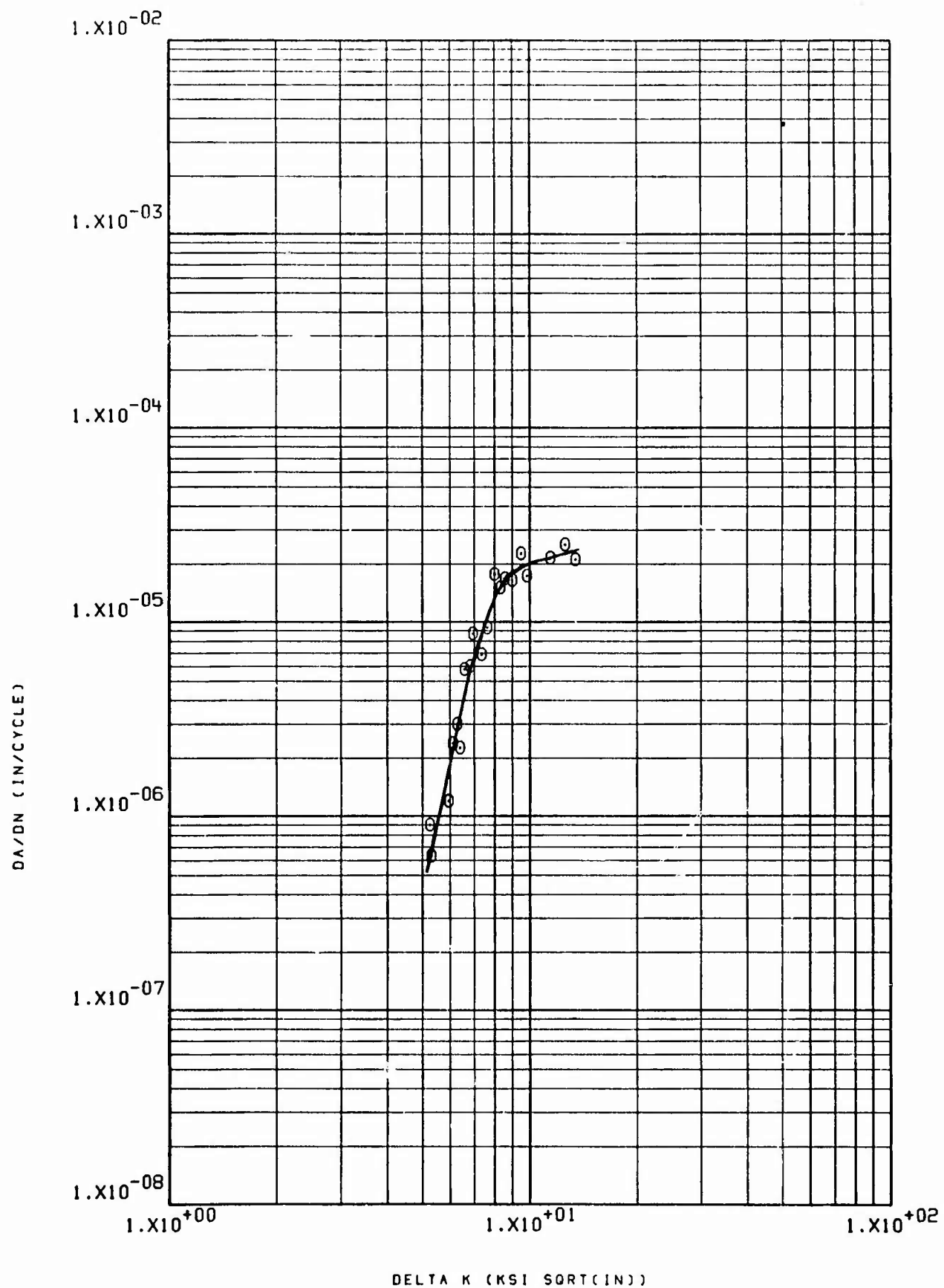


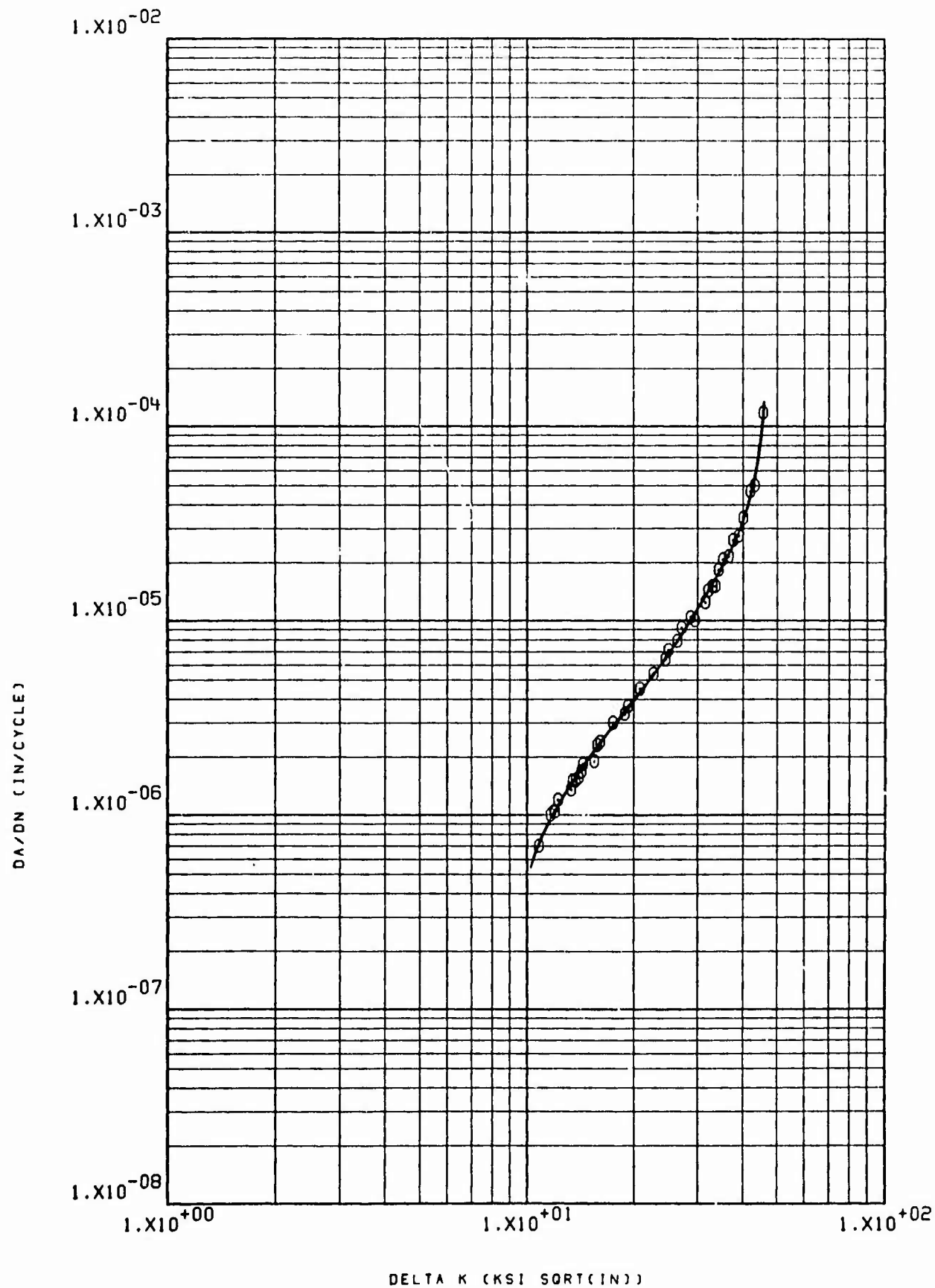


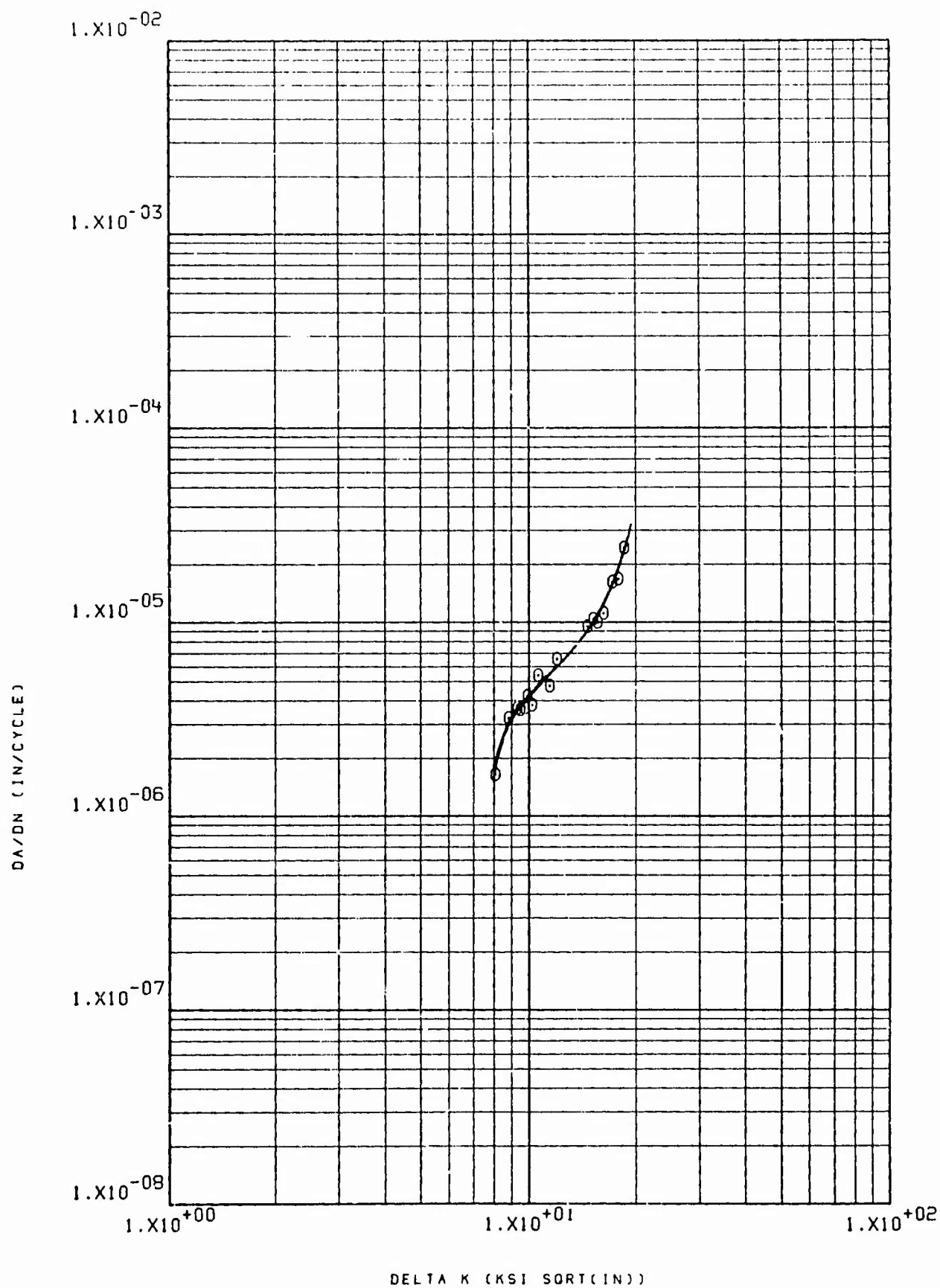


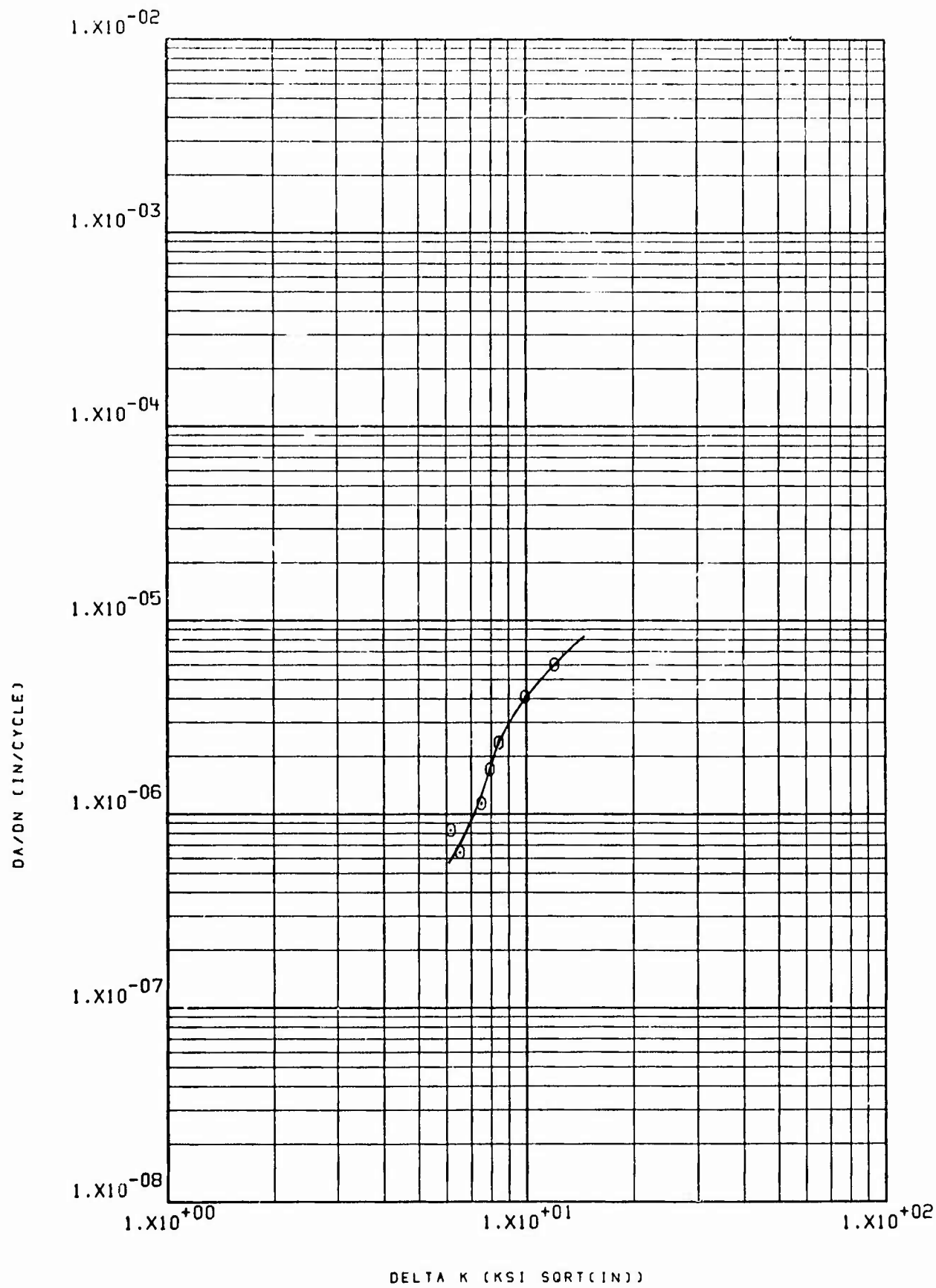


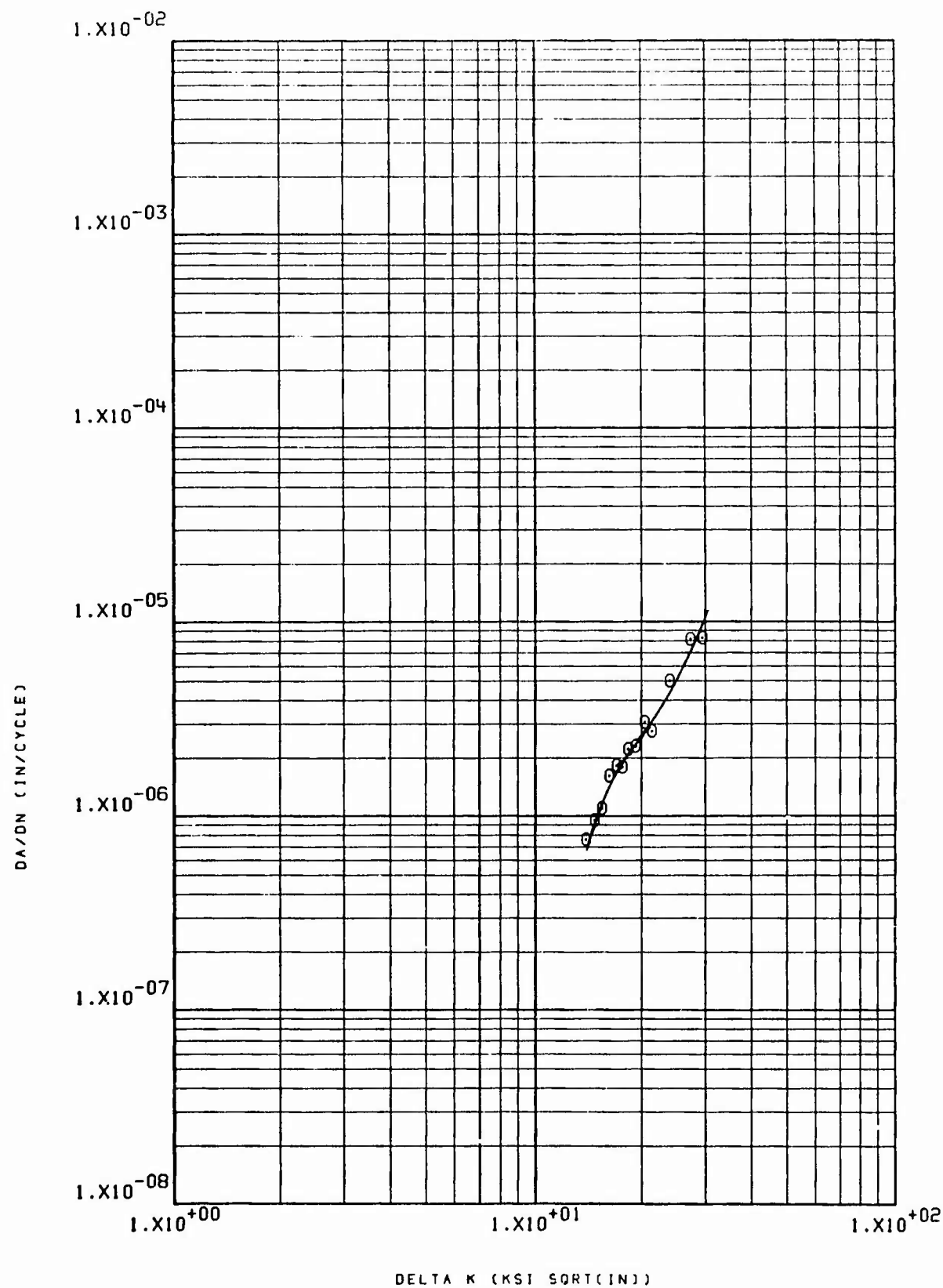


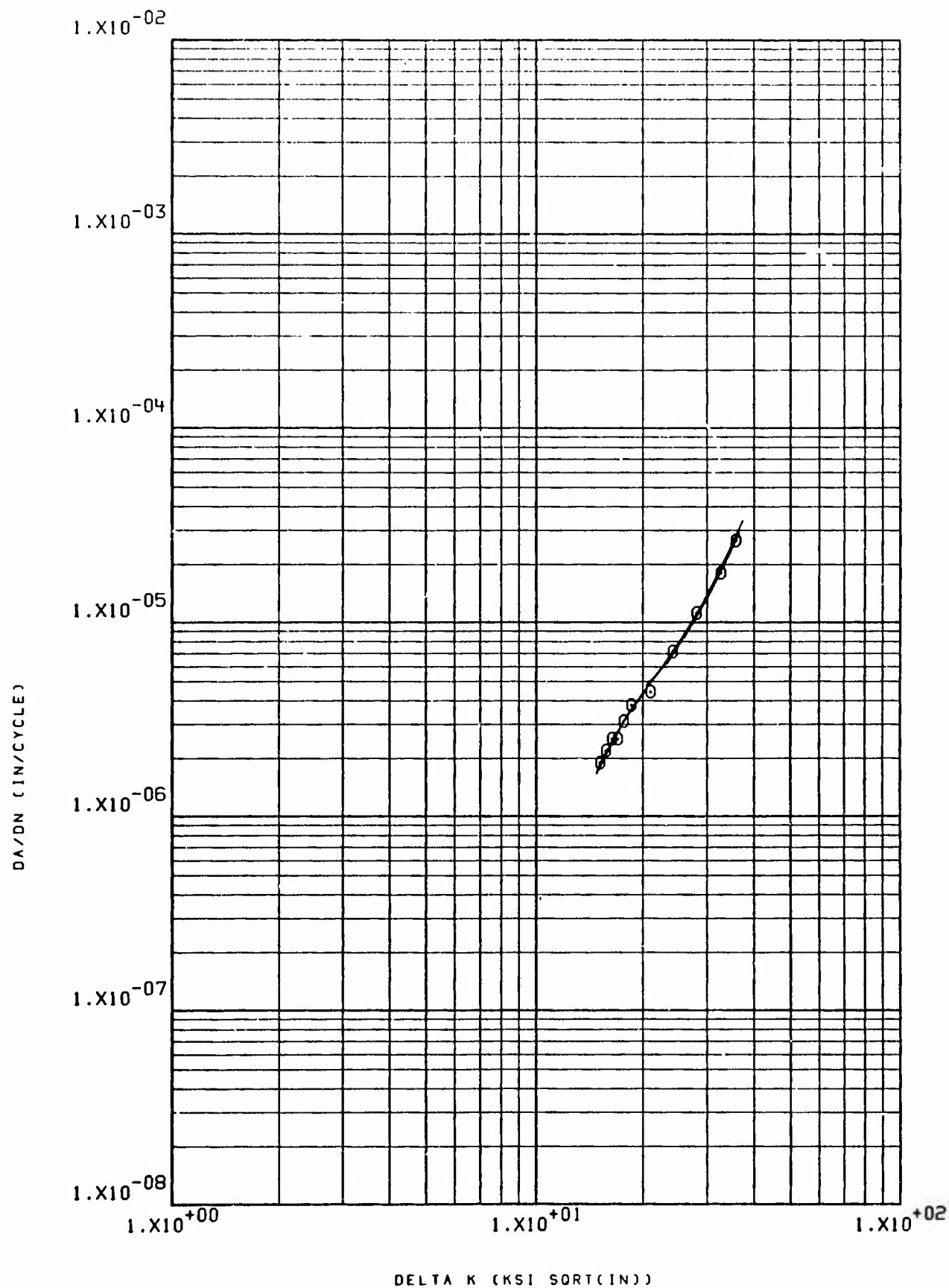


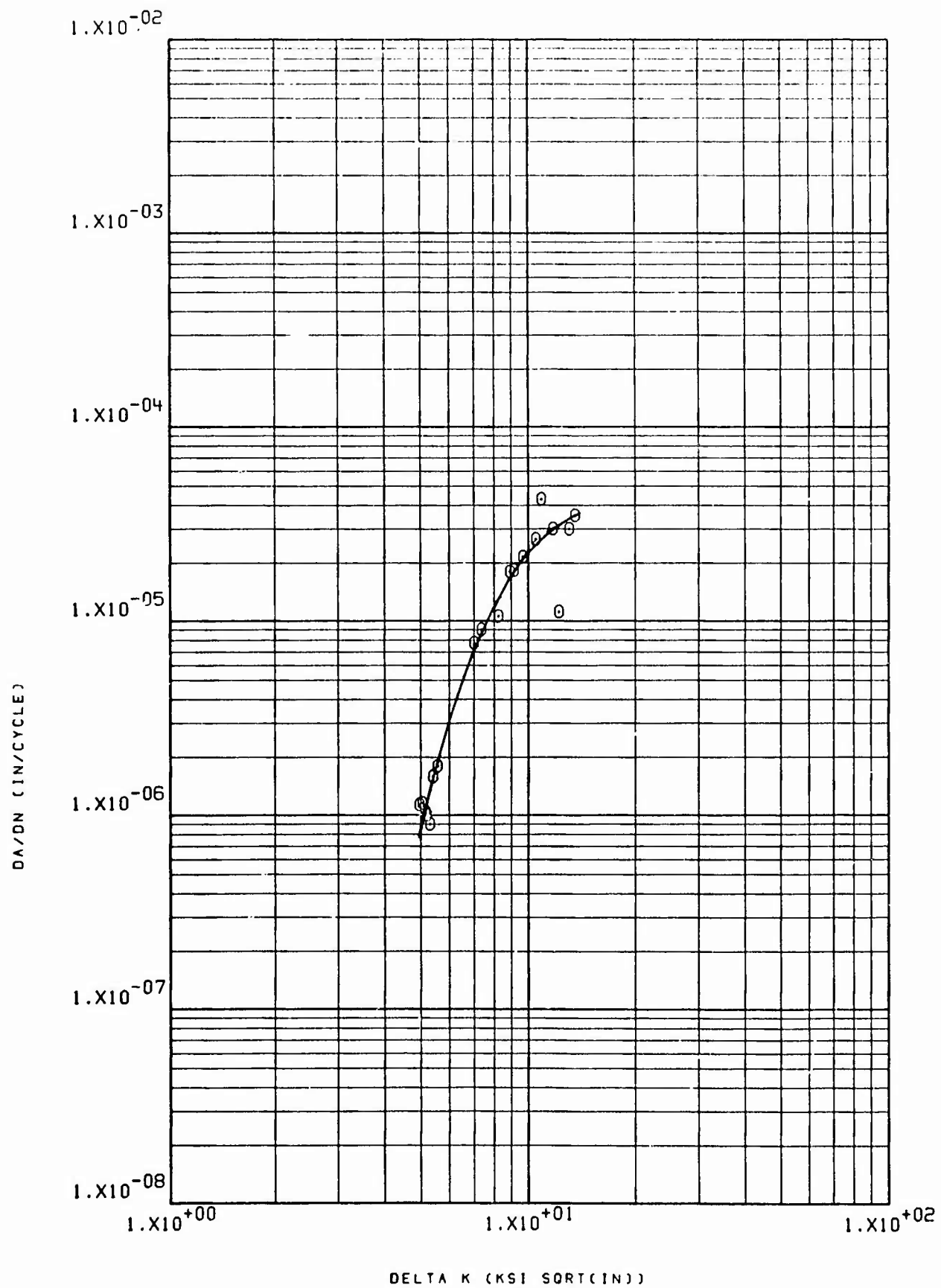


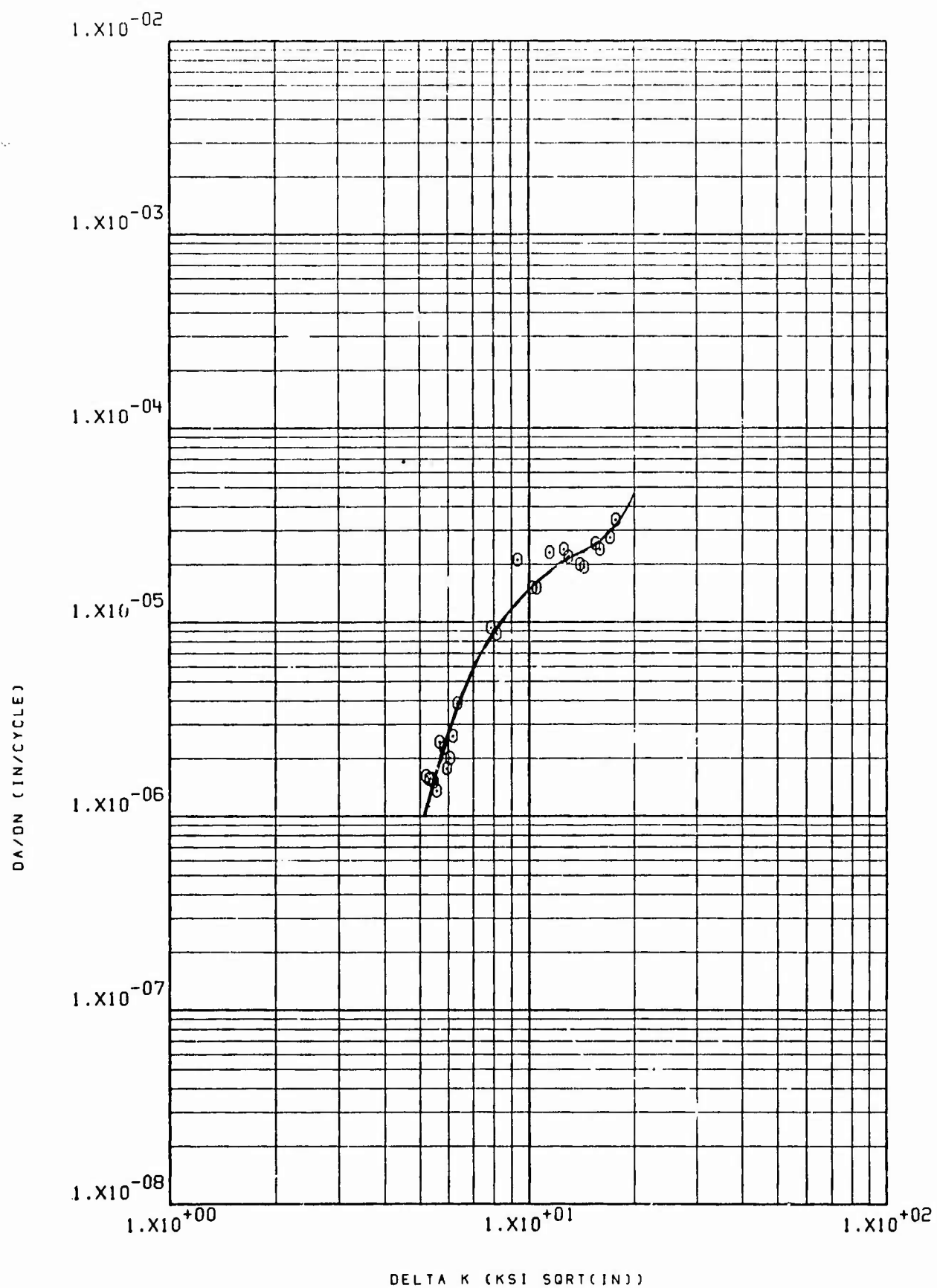


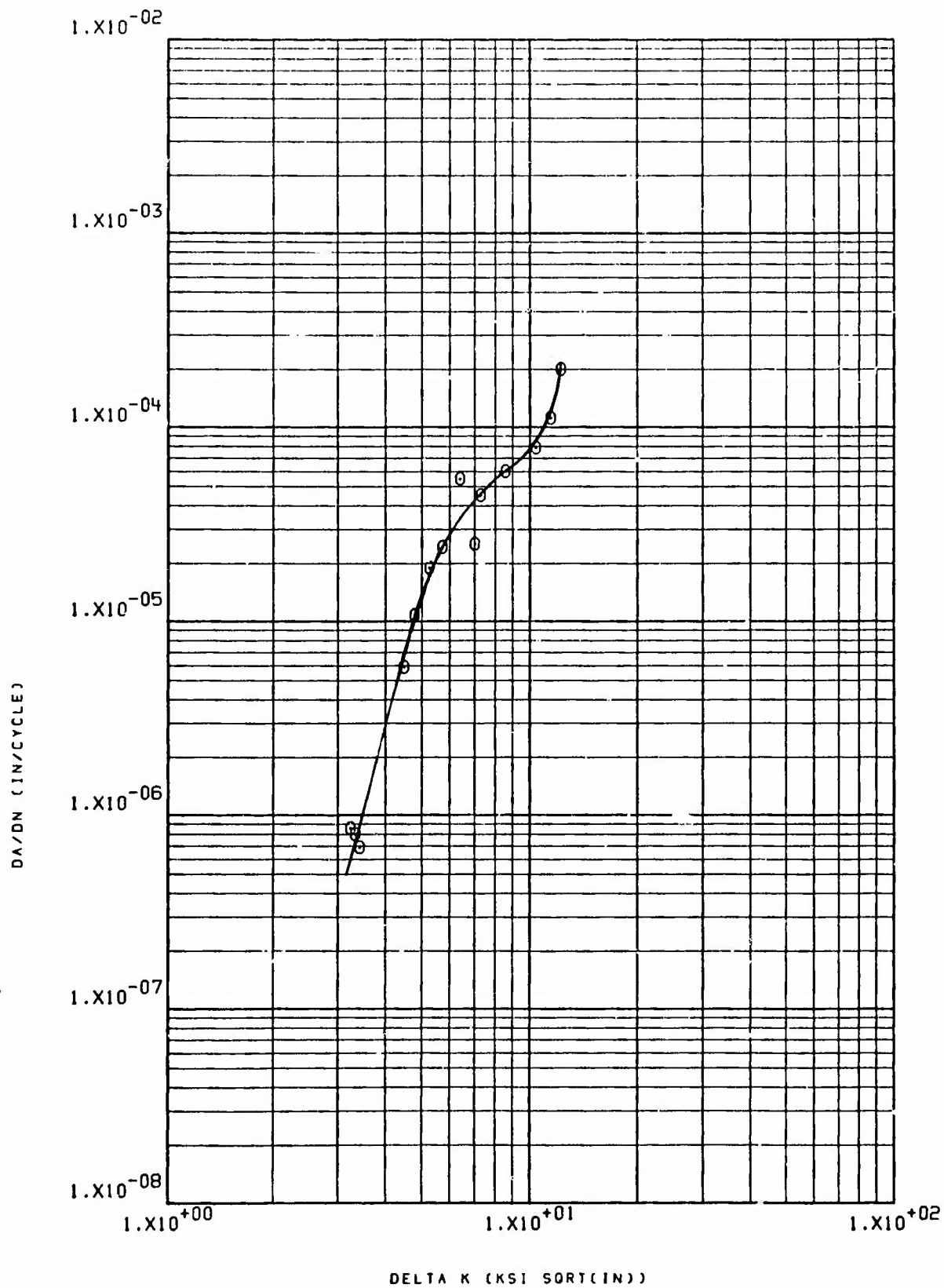


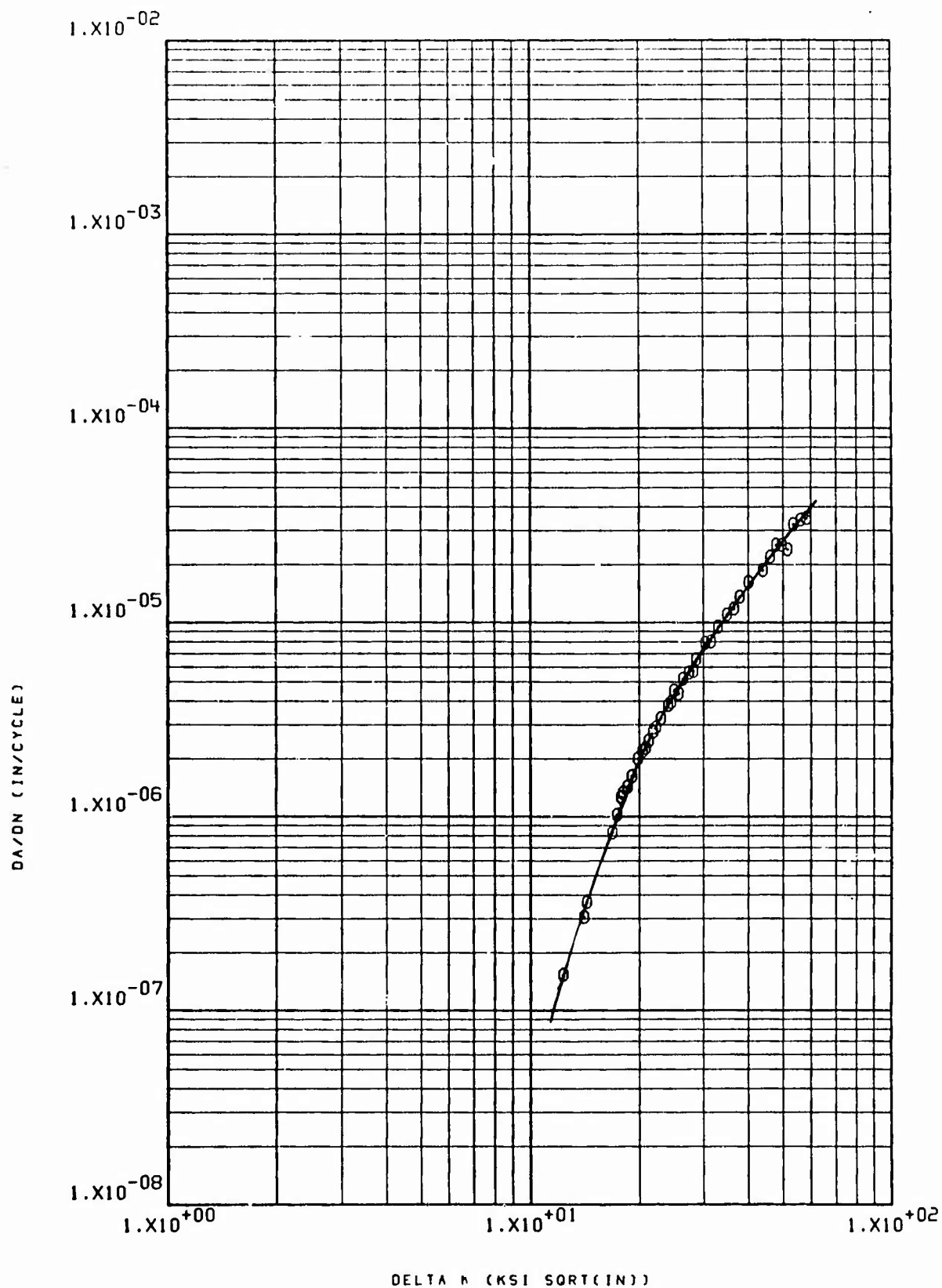




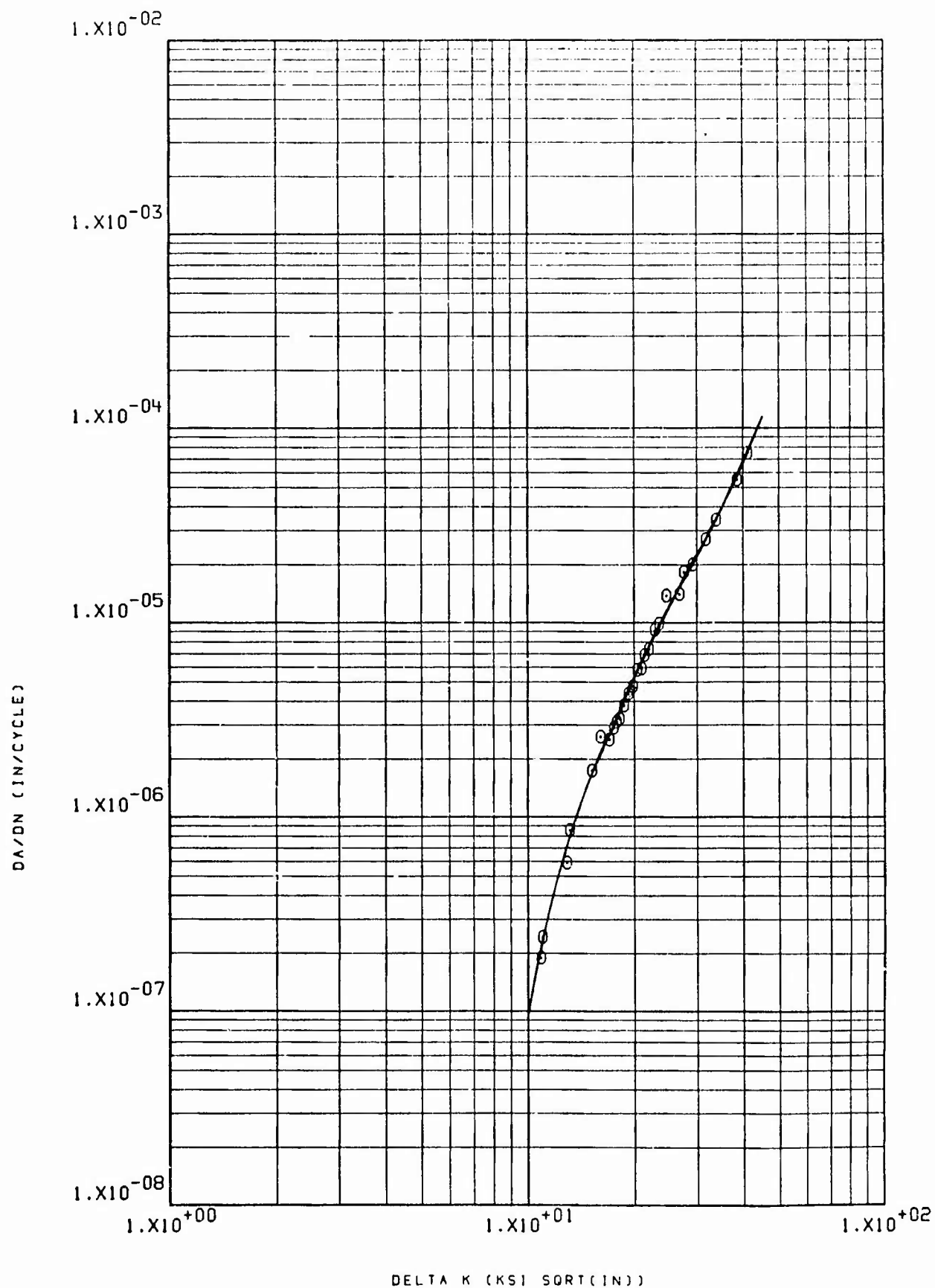


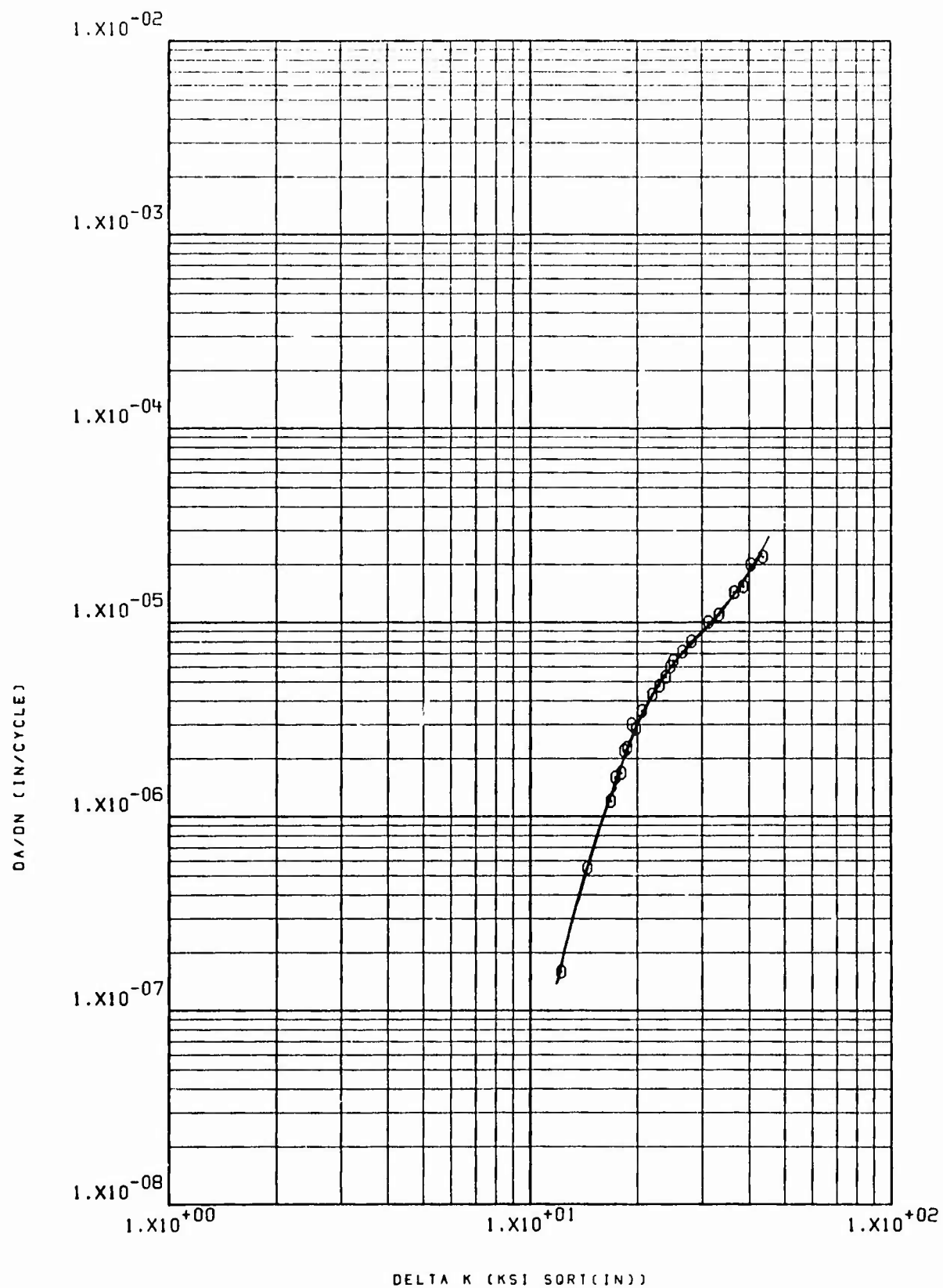


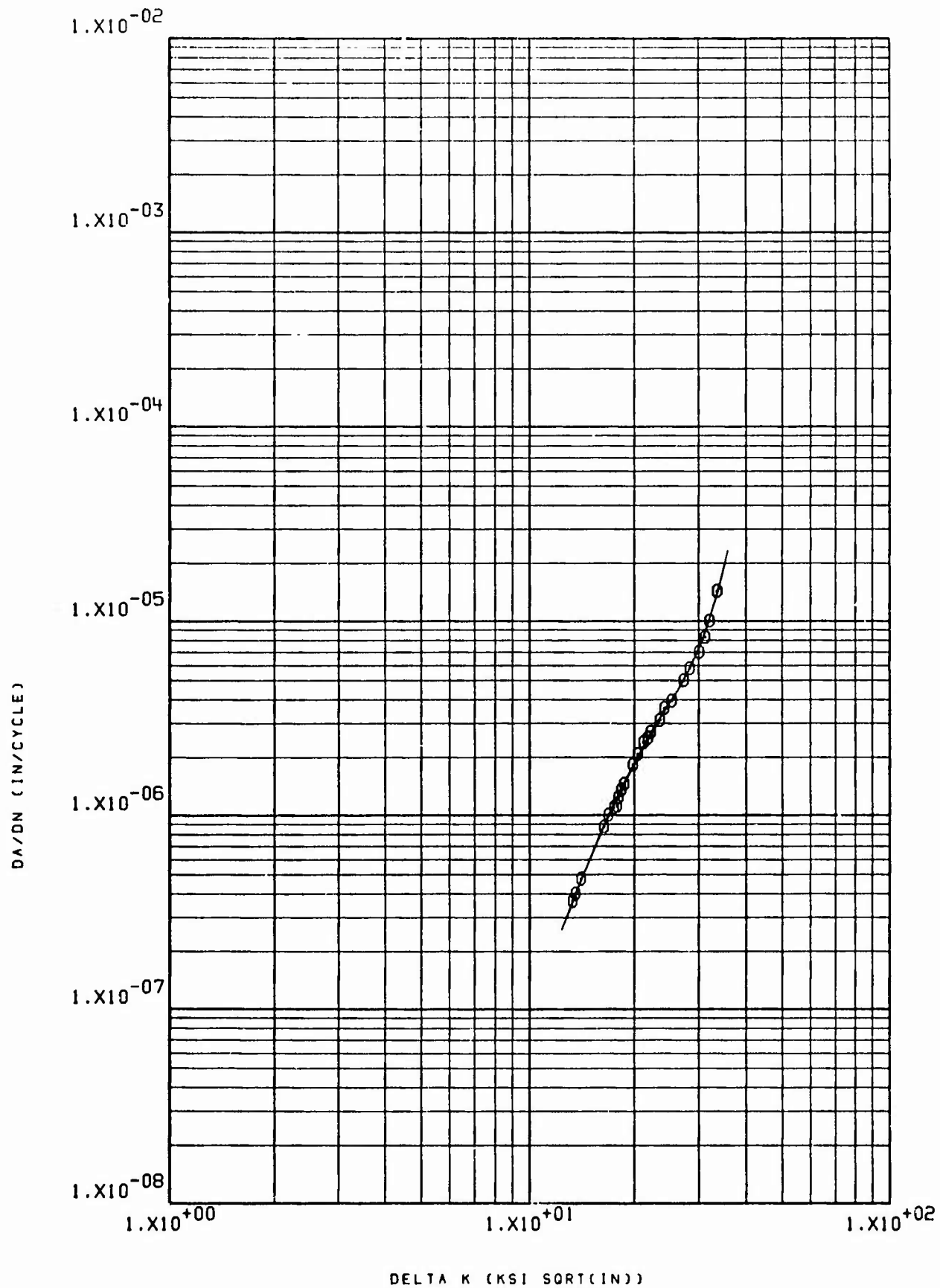


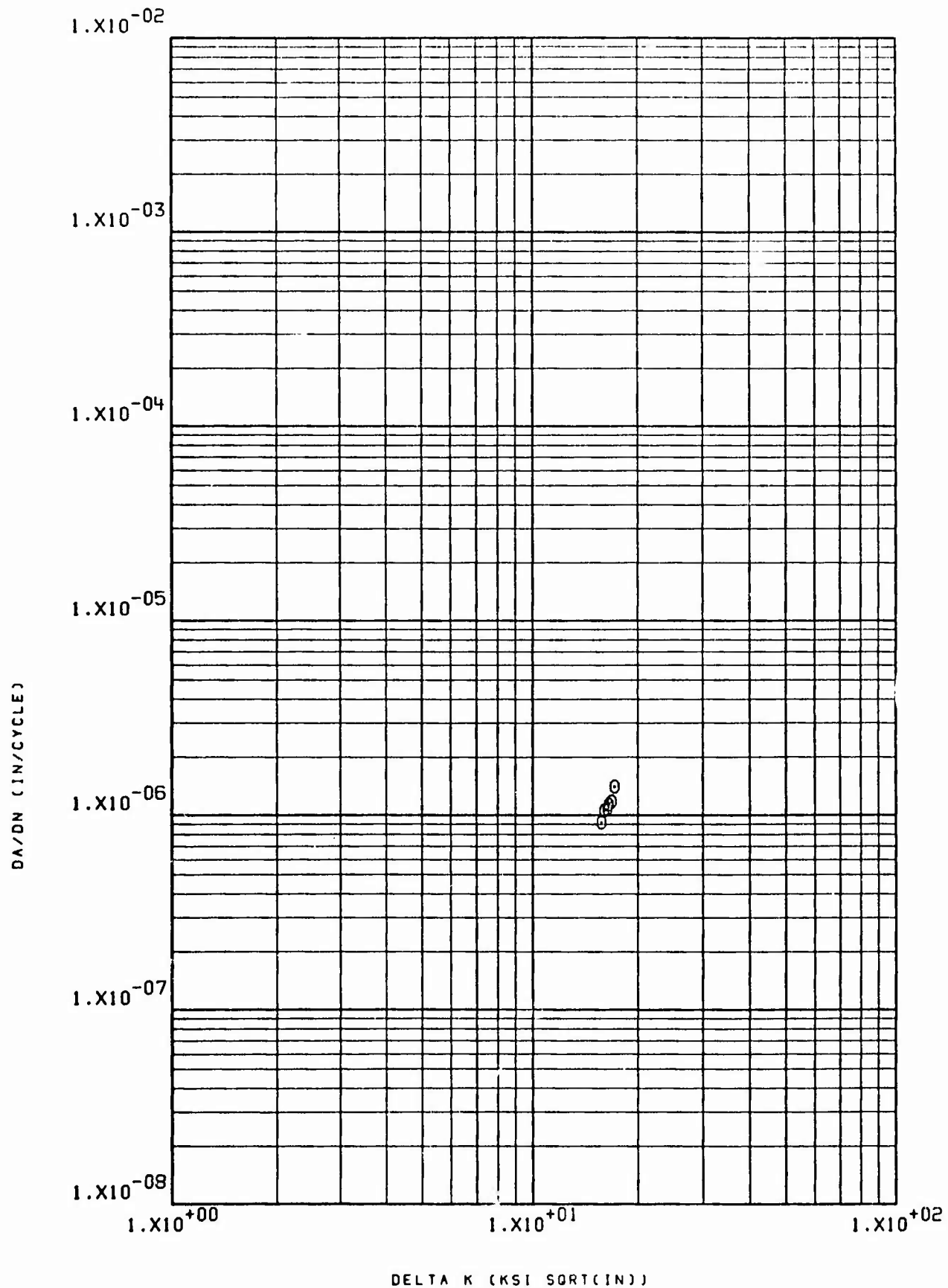


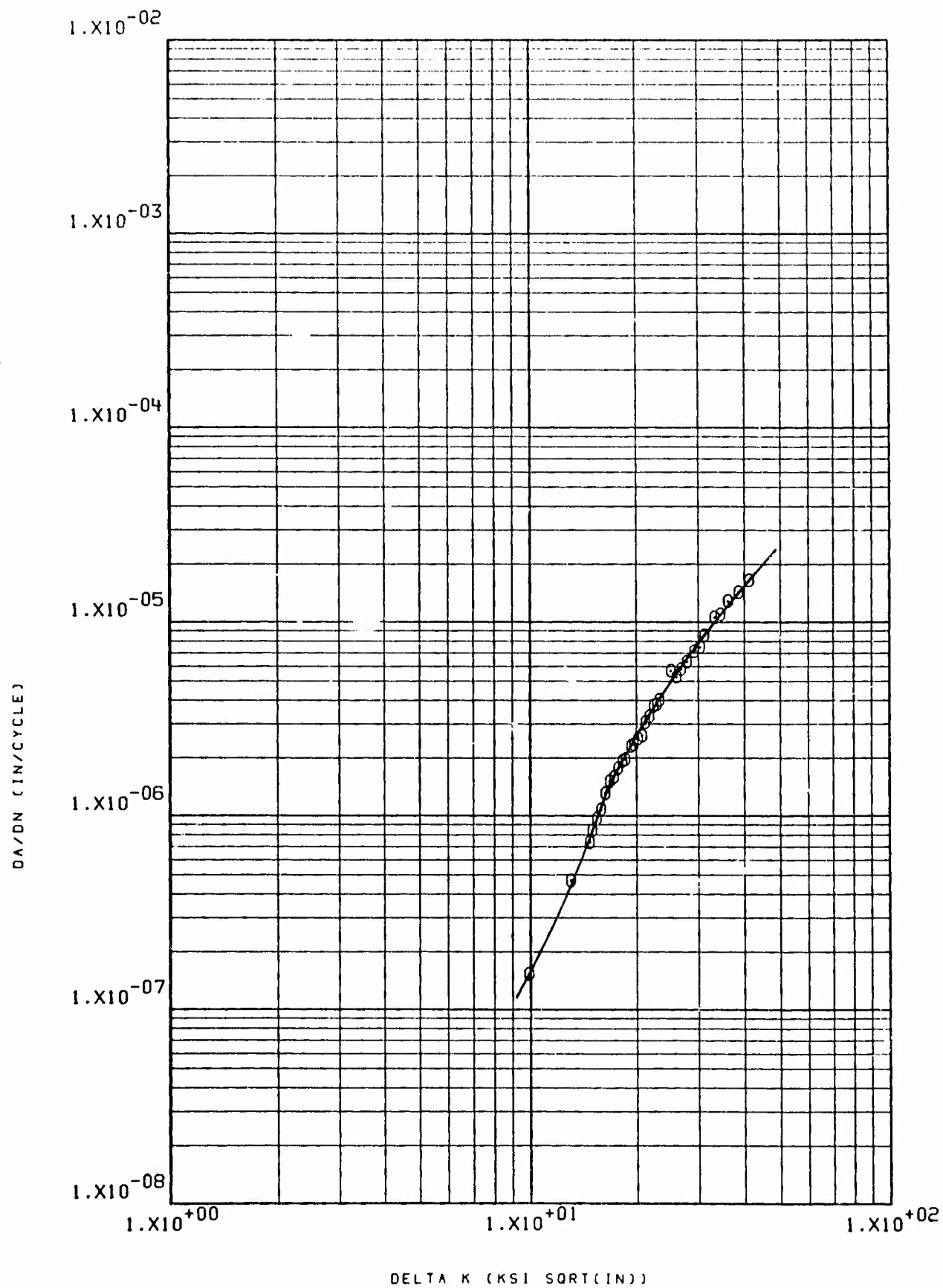
40 NVR 56-1 PH13-8 H1000 ROLL BAR 360CPM LHA RT R=.08



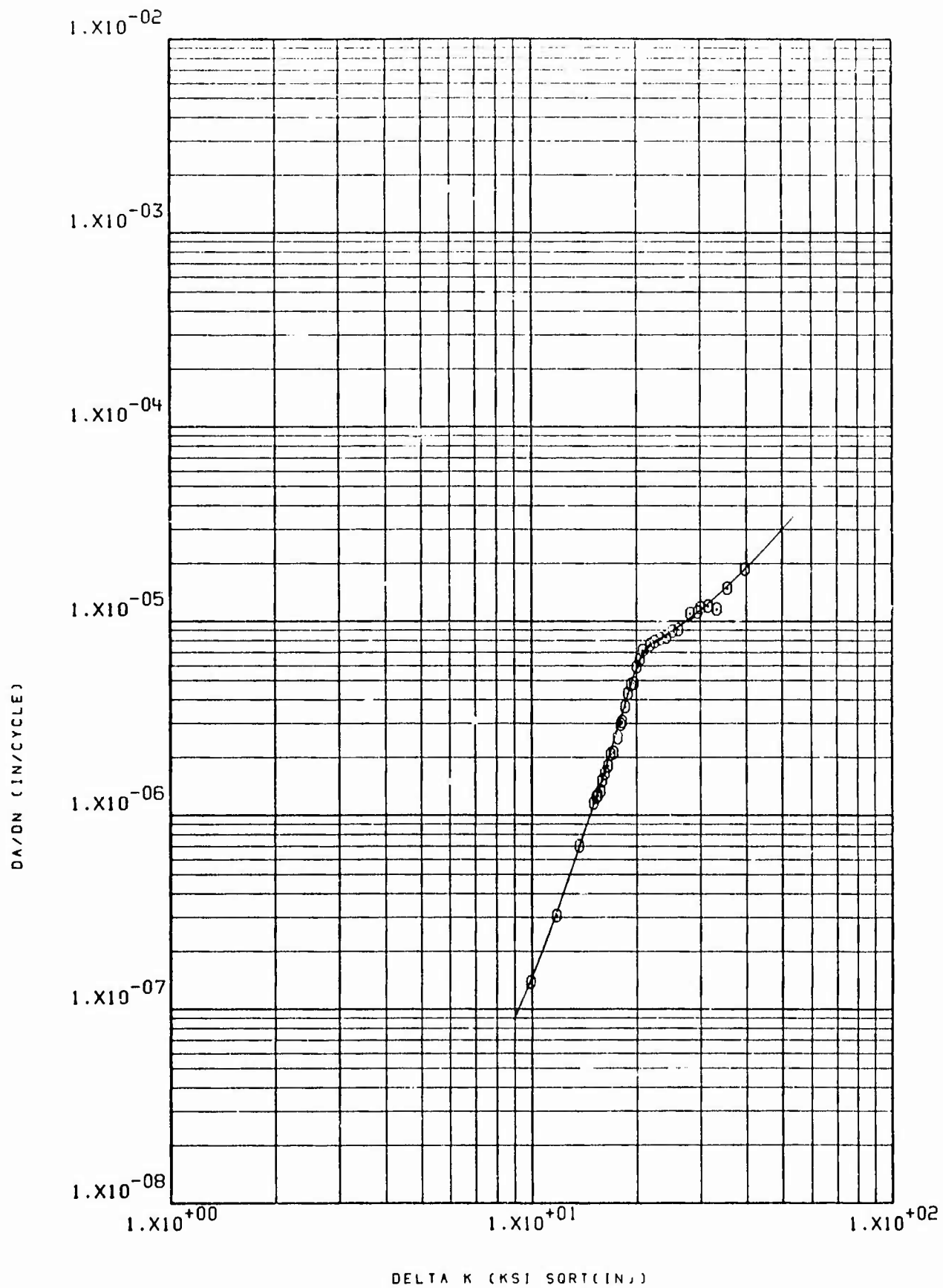


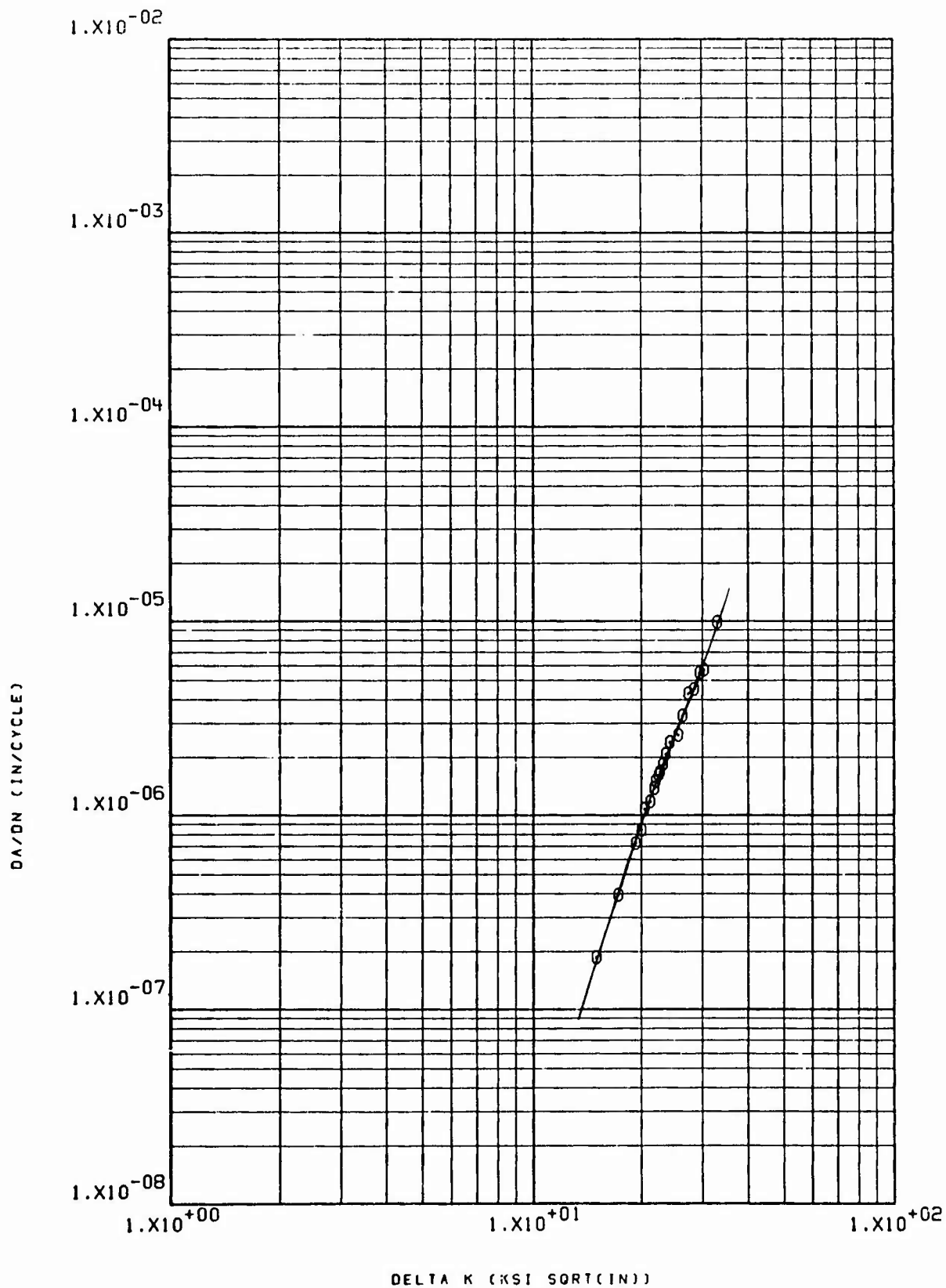


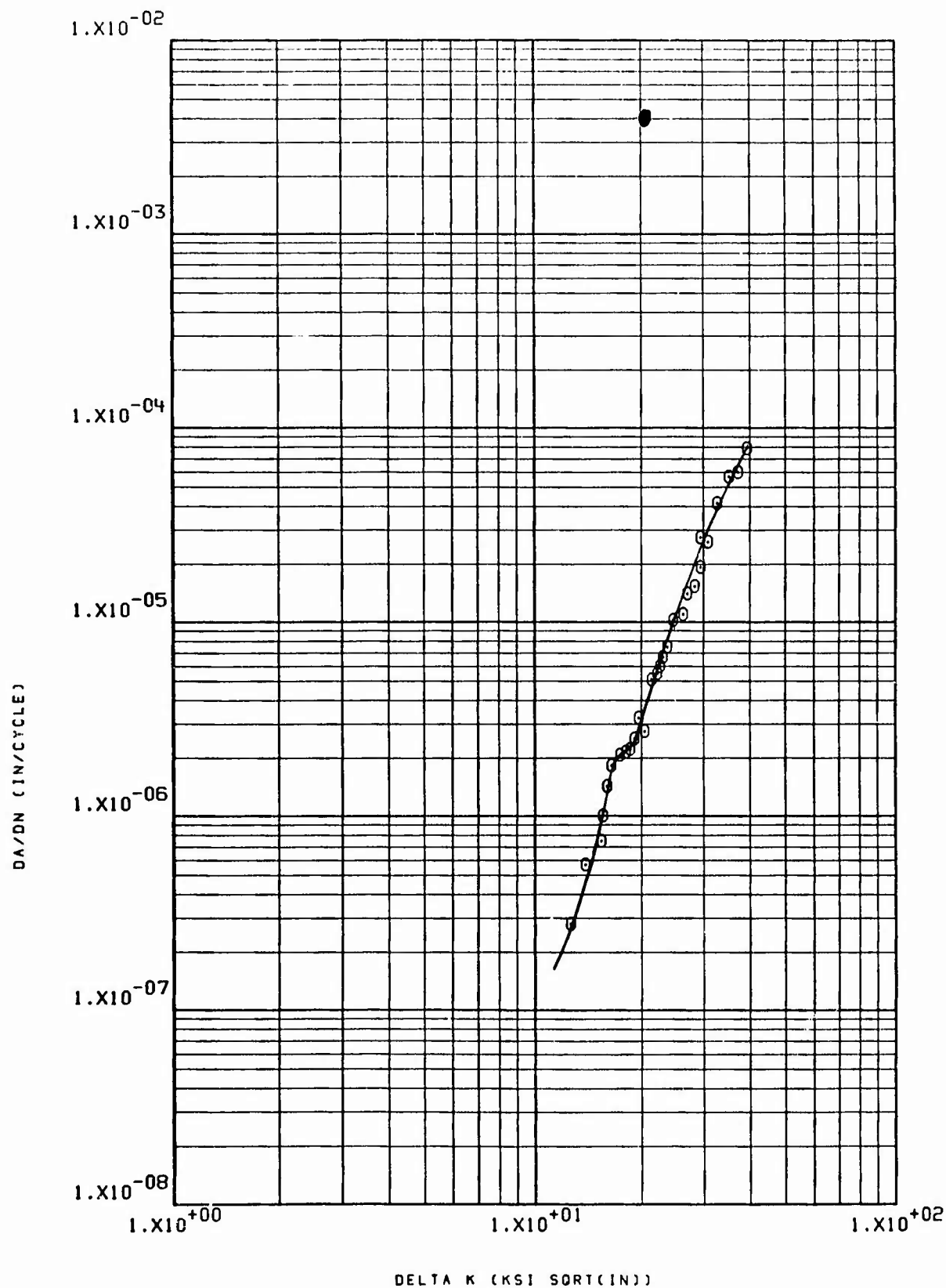




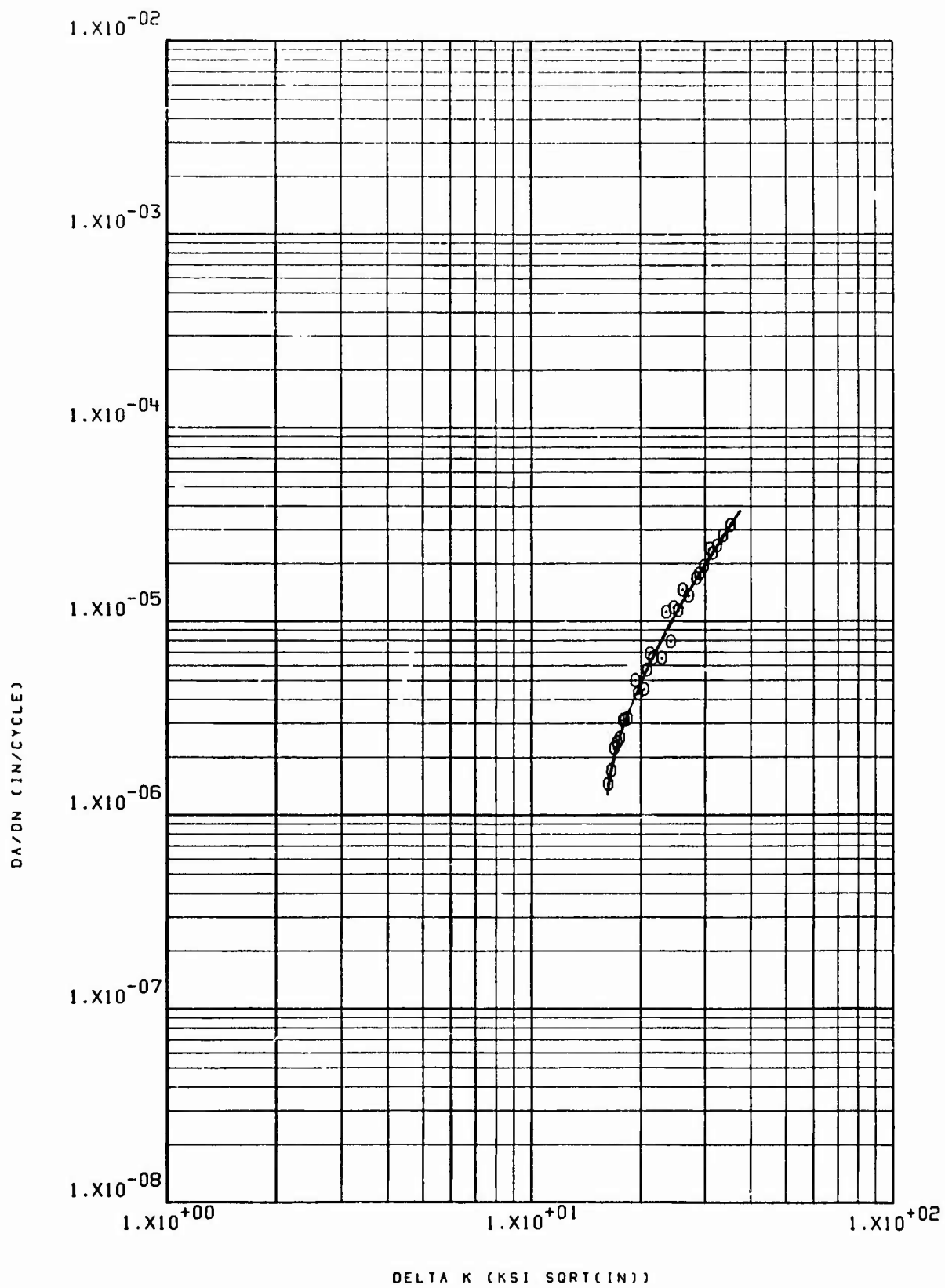
40 NRW 56-6 PH13-8 ROLL BAR H-1000 LHA RT 60CPM R=.08



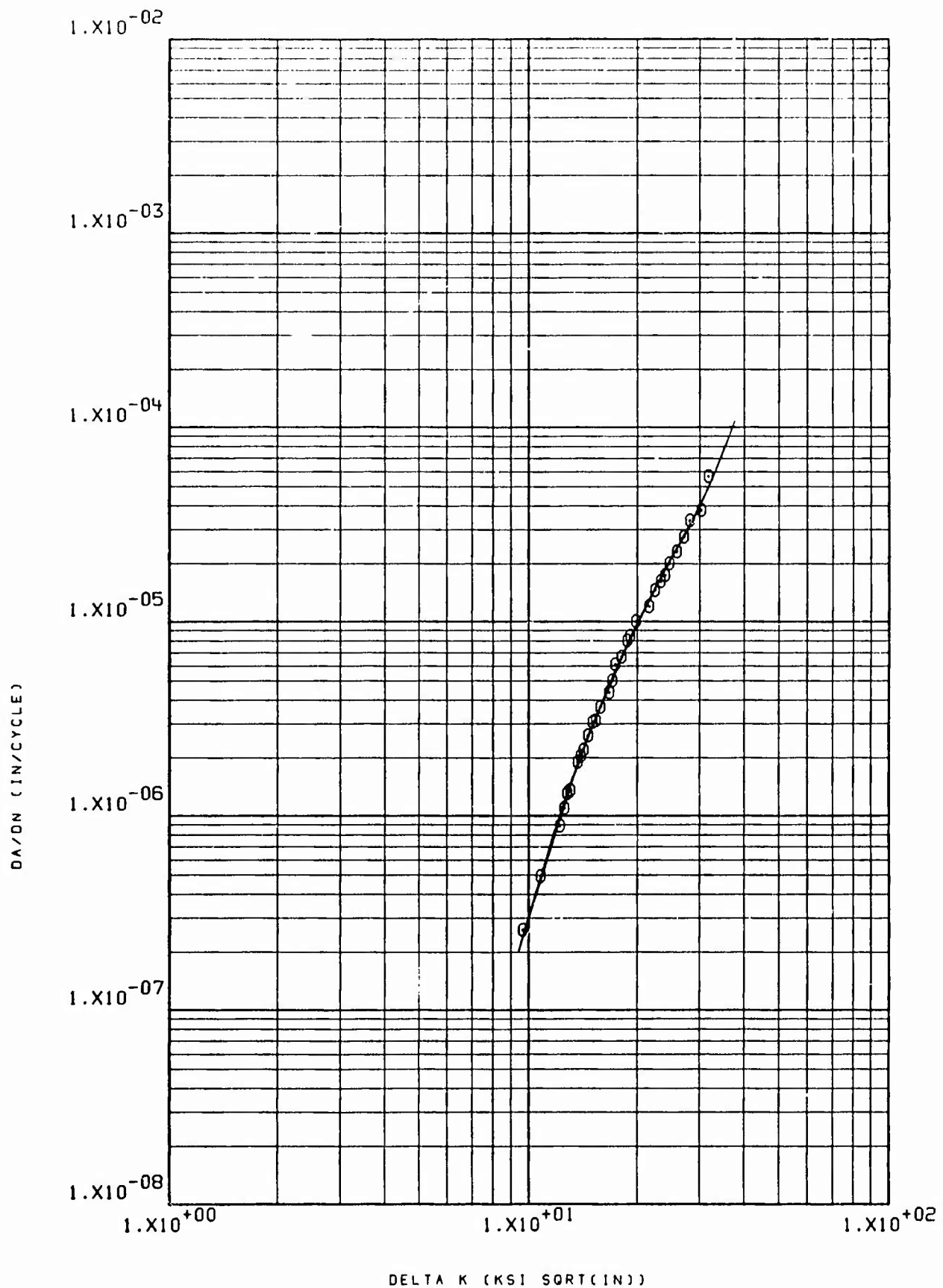




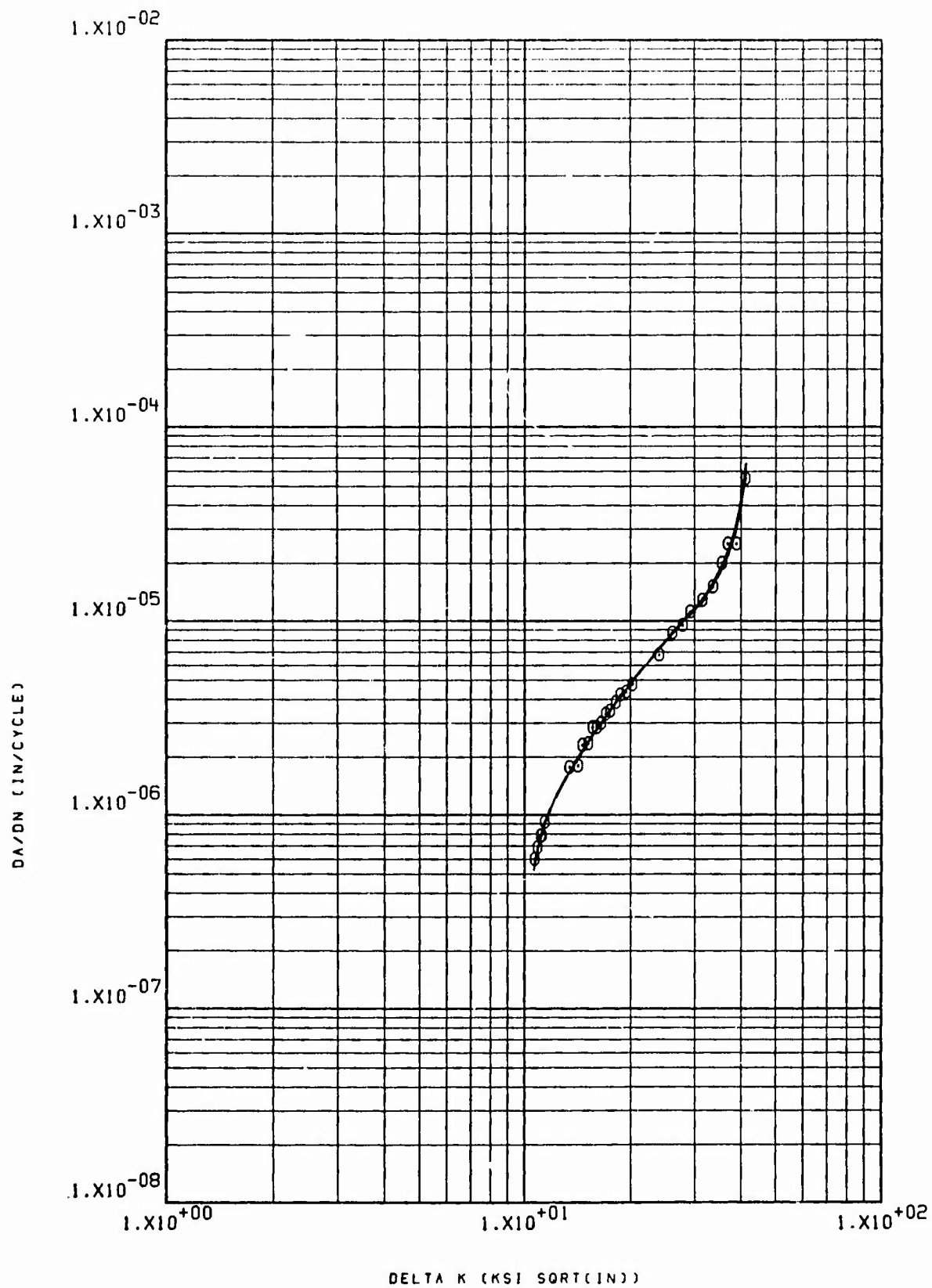
40NRW56-9 PH13-8 H-1000 SUMP 60CPH RT R=.08



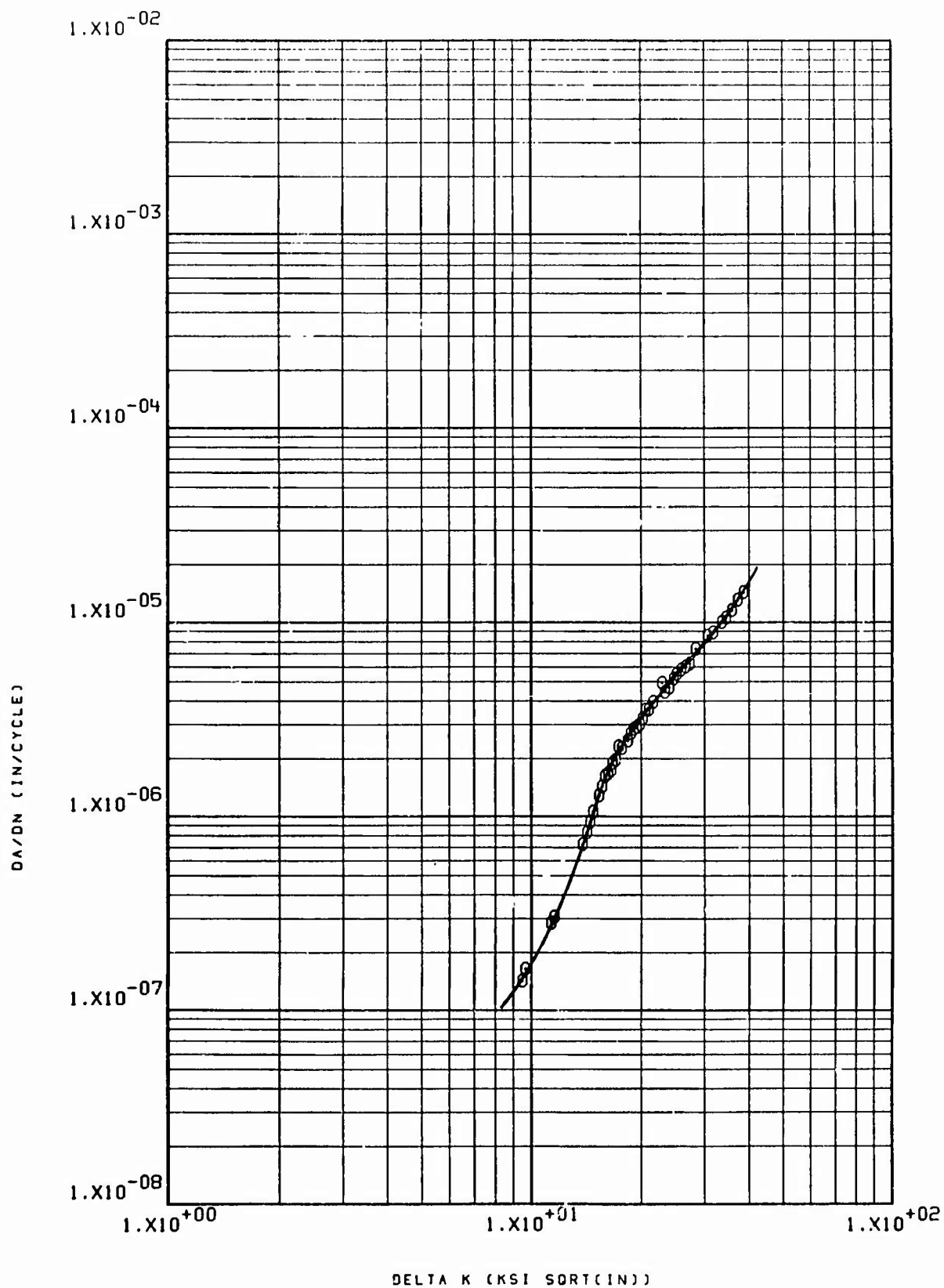
40 NRW 56-10 PH13-8MO (H1000) STW RT R=.08 6 CPM



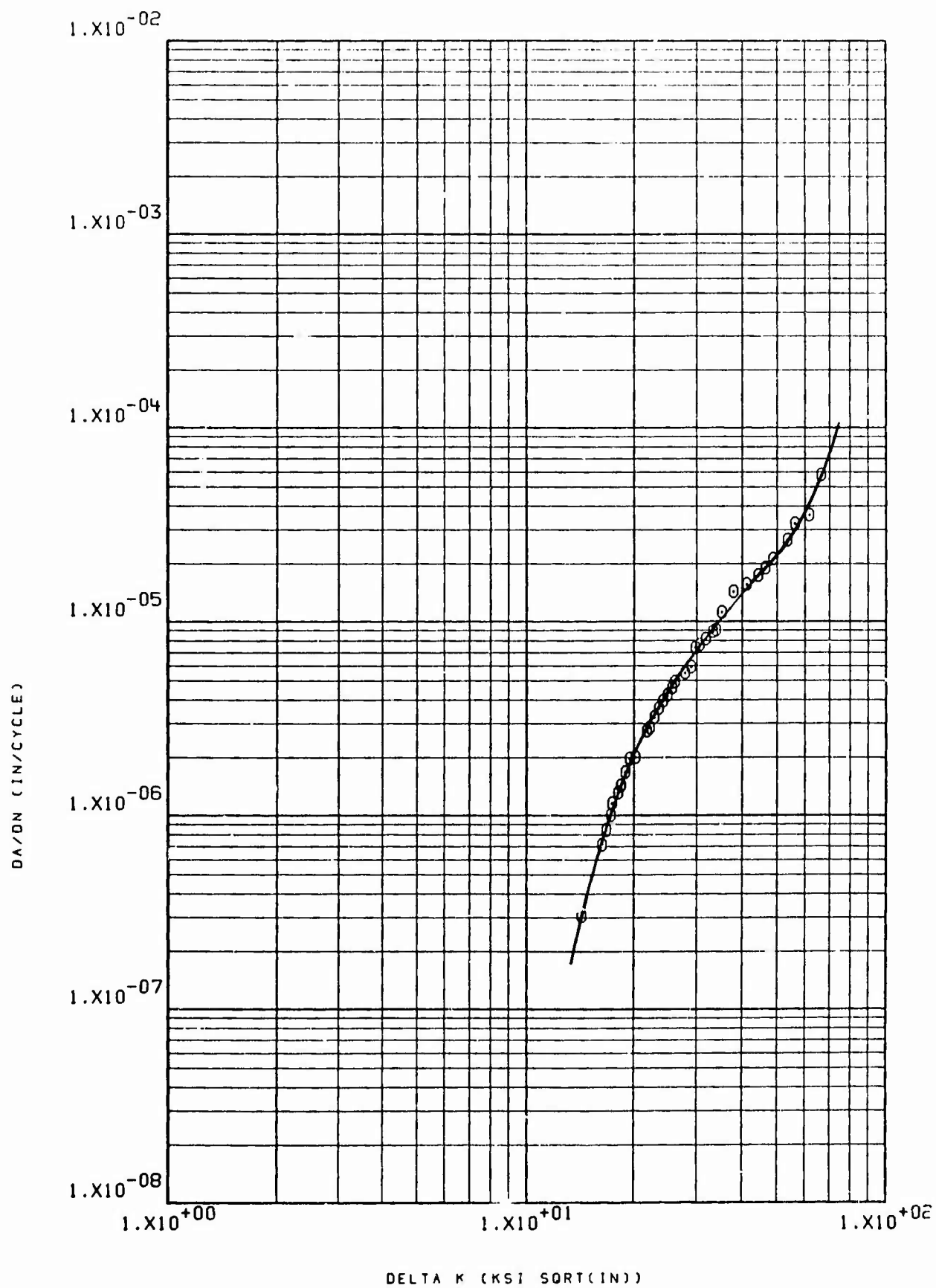
40 NRW 56-11 PH13-8 ROLL BAR H-1000 SUMP 60CPM RT R=.3



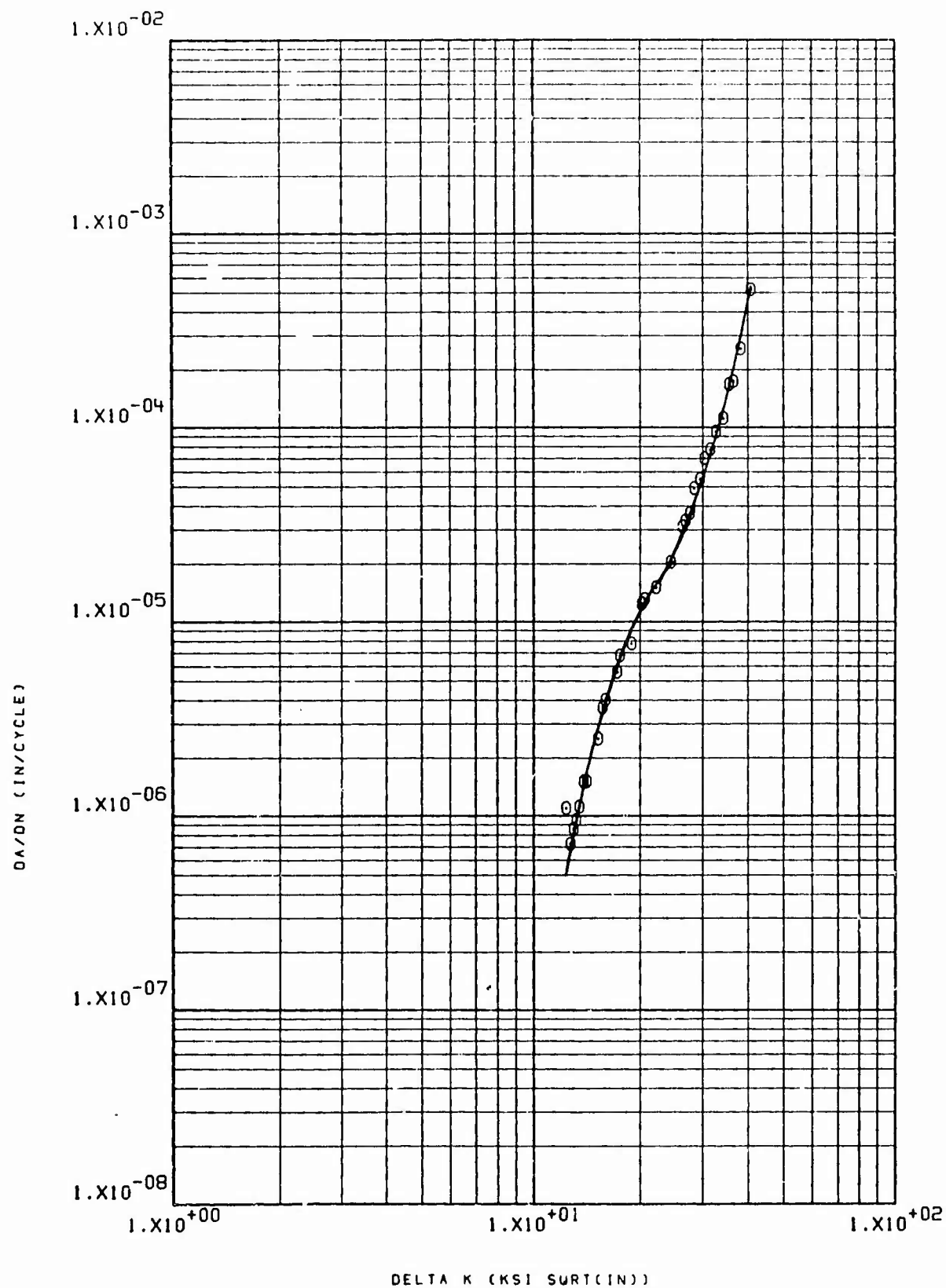
40 NRW 56-12 PH13-8MO H1000 L.H.A. R.T. 360CPM R=.5



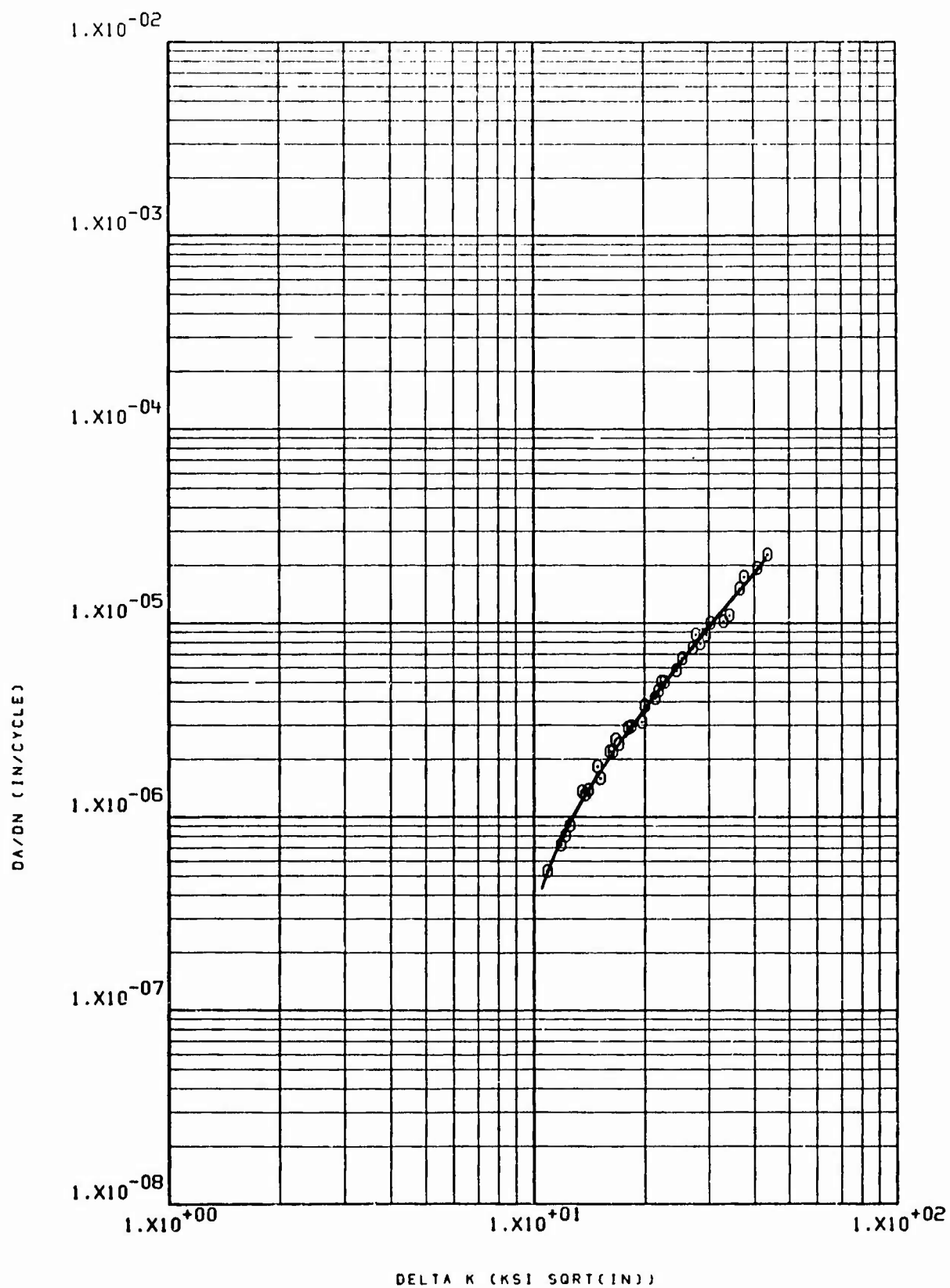
40 NRW 56-13 PH 13-8 M0 H1000 LHA RT R=.08 360CPM



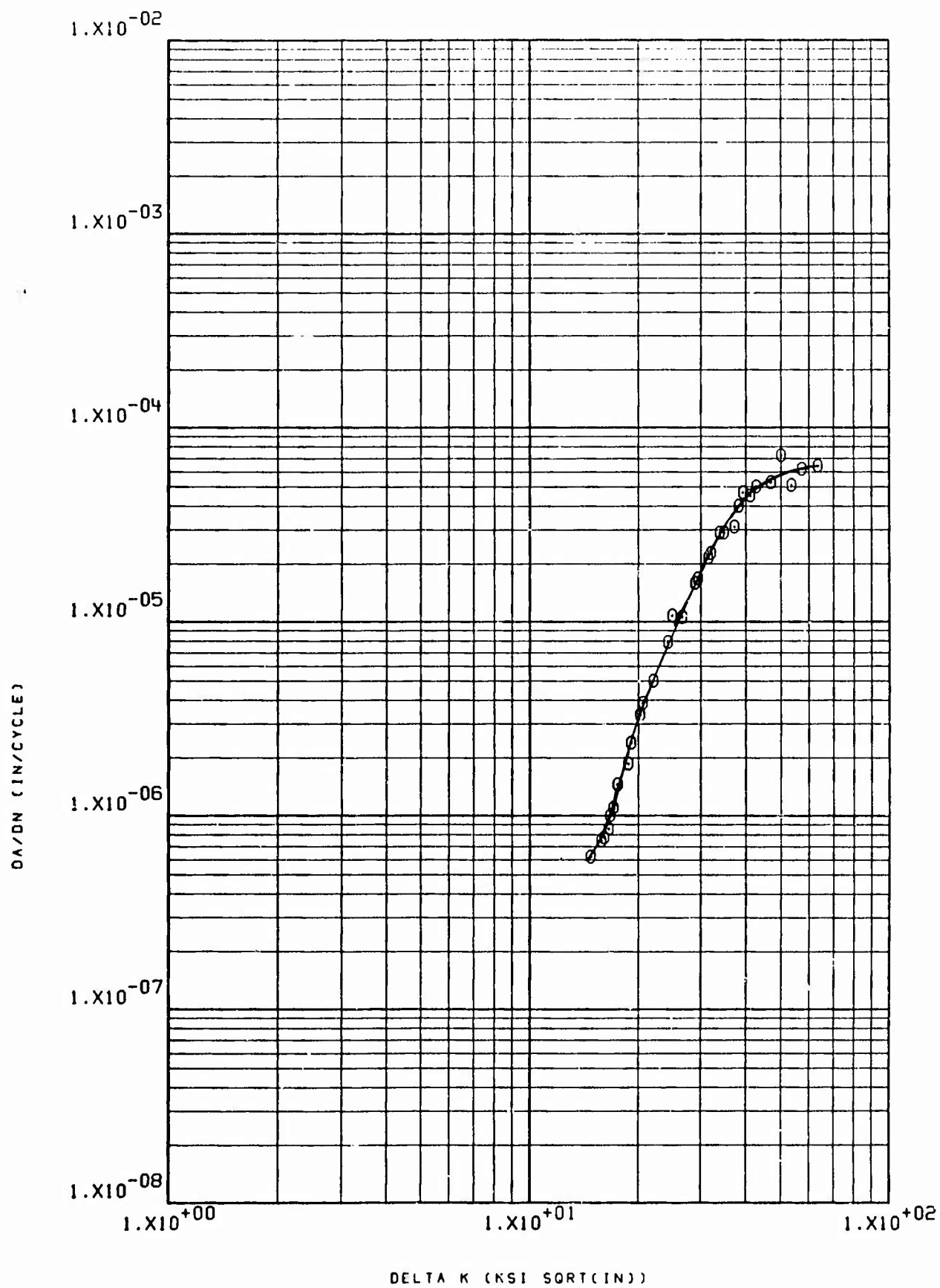
40 NRW 56-14 PH13-8 H-1000 ROLL BAR LHA RT 36GCPM R=.08

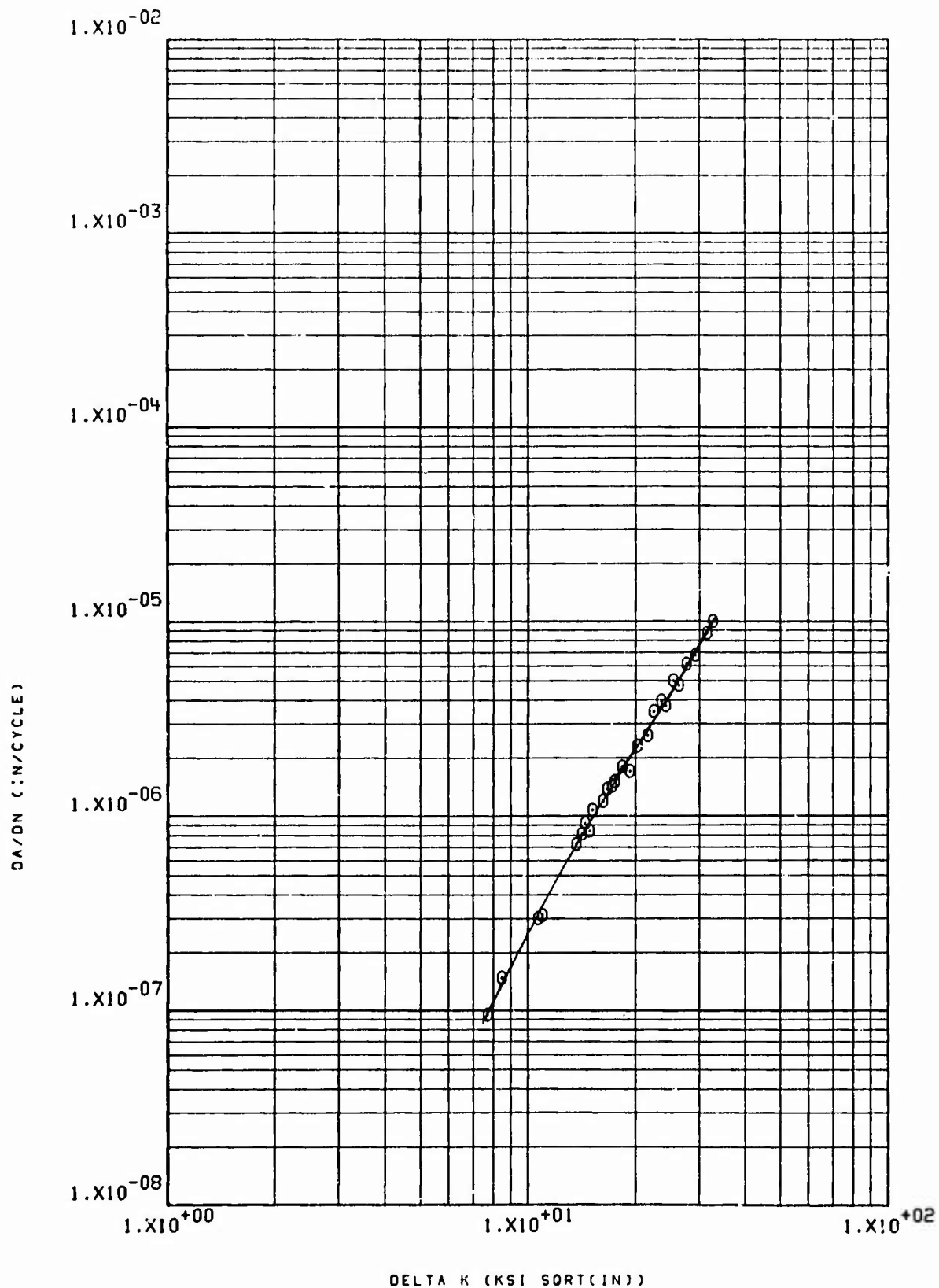


40 NRW 56-15 PH13-8MO H1000 STW RT R=.30 60CPM

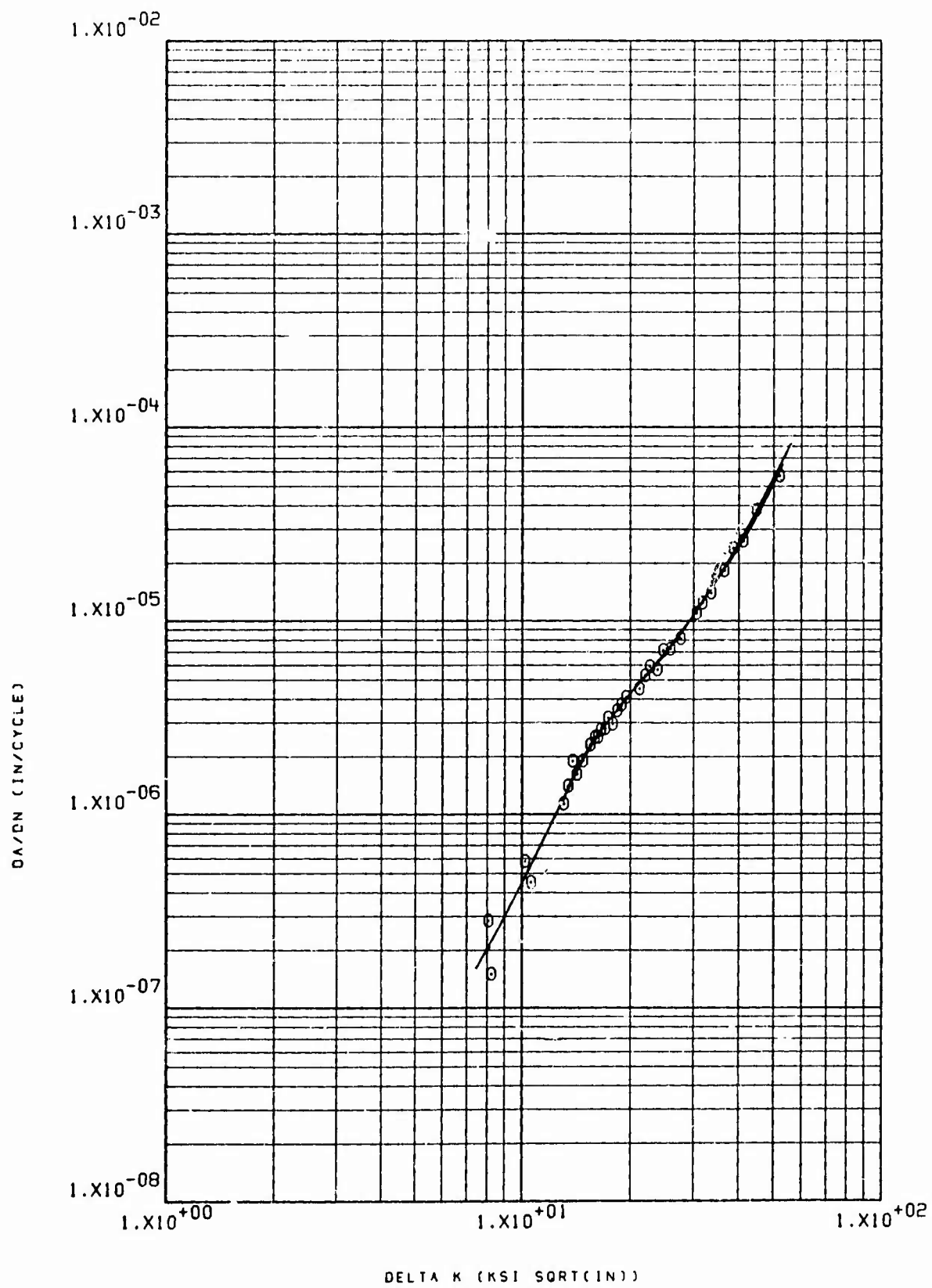


40 NRW 56-16 PH13-8MO H1000 LHA RT R=.30 360CPM



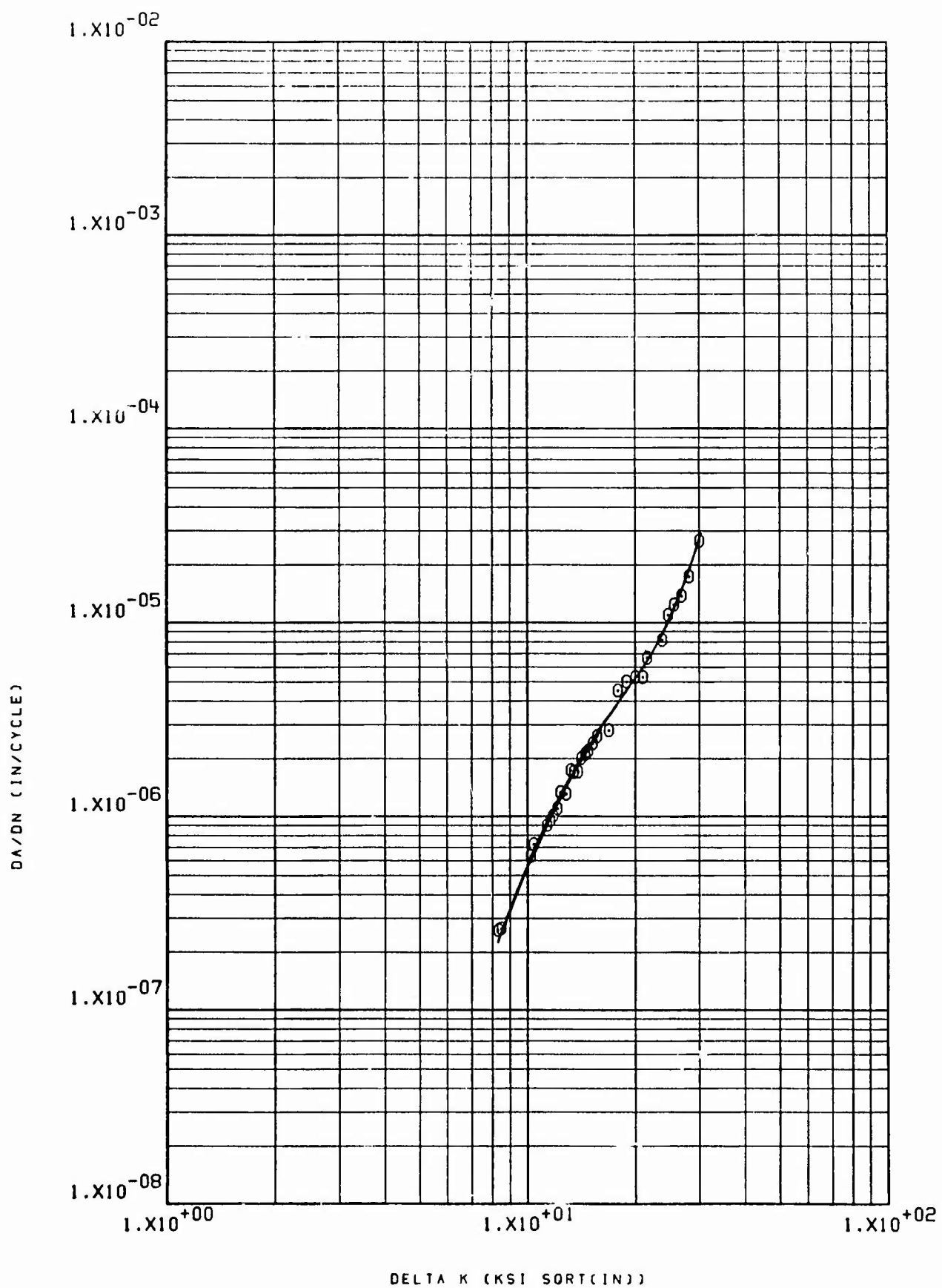


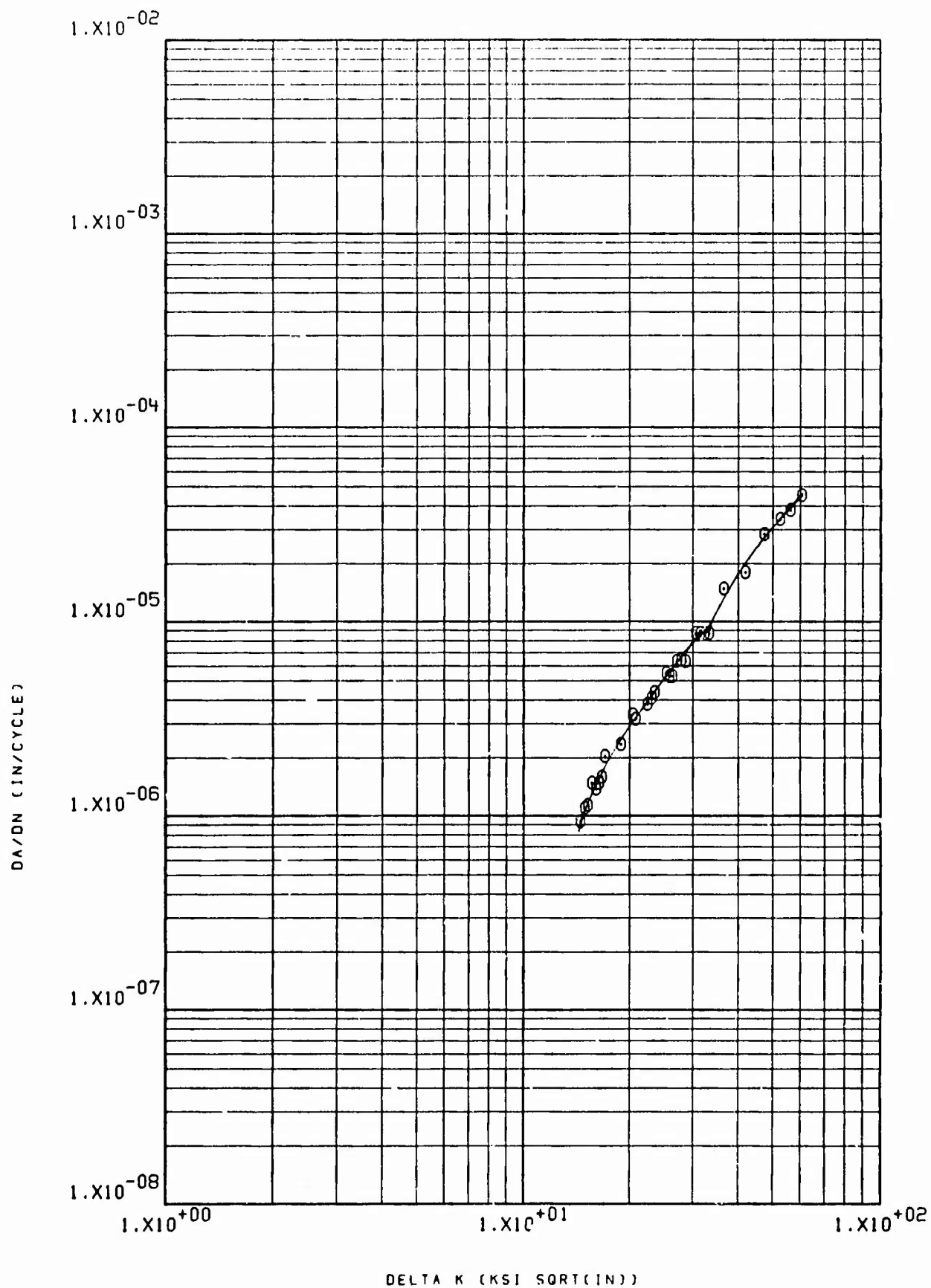
41NRV57-1 PH13-8 H-1000 LHA -65 F 360CPM R=.08

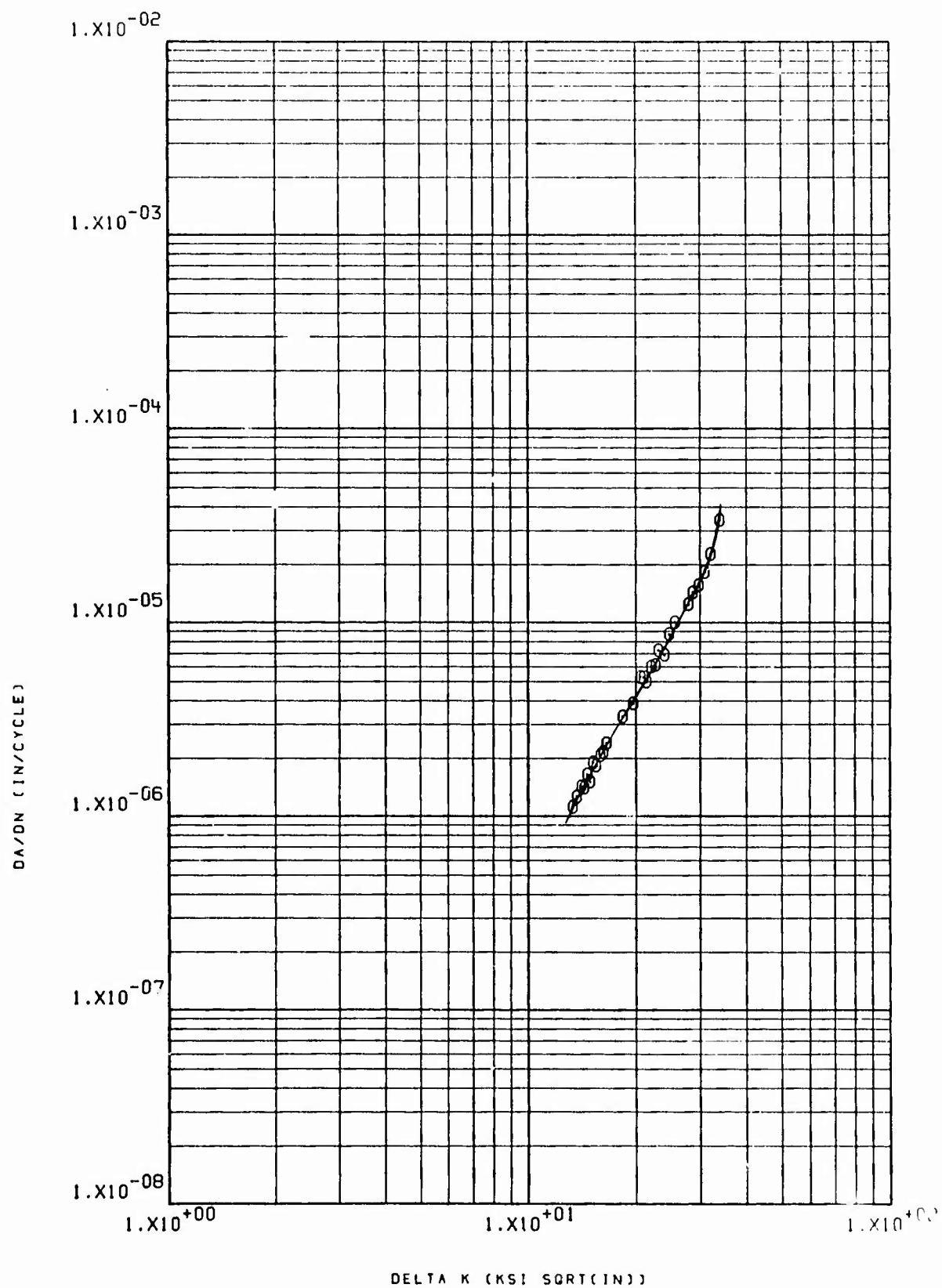


41 NRW 57-2 PH13-8MO (H1000) LHA RT R=.08 360CPH

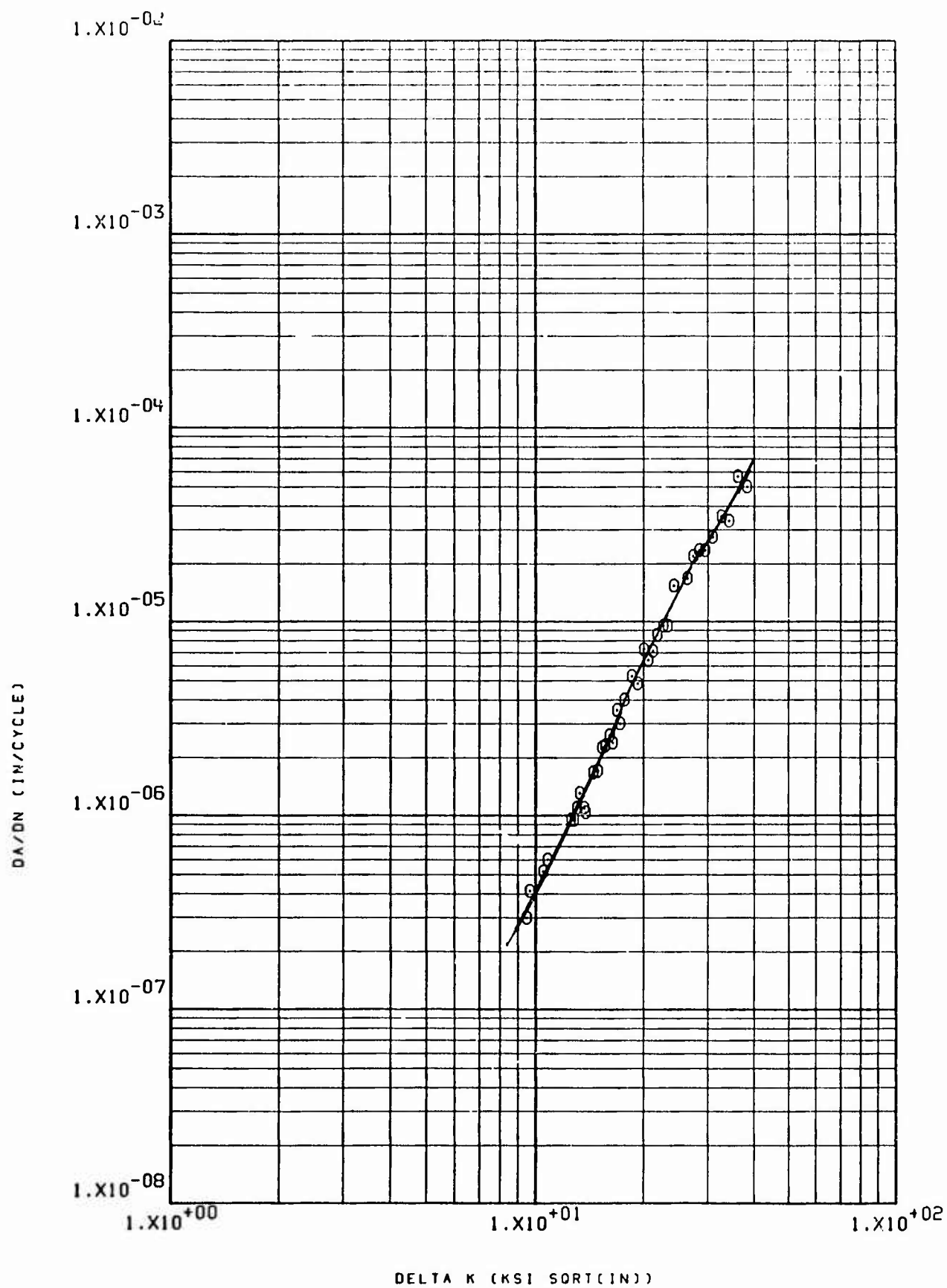
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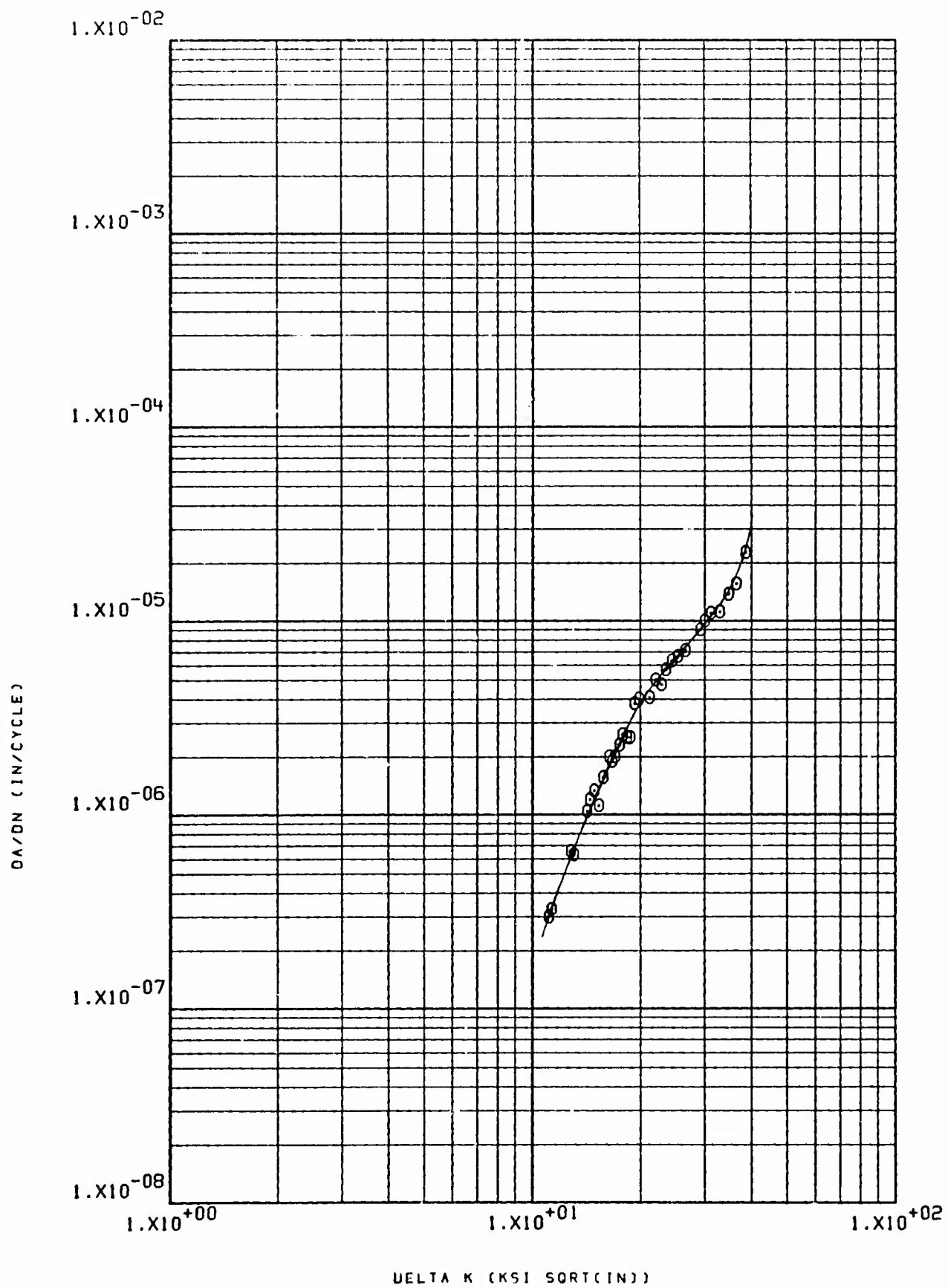






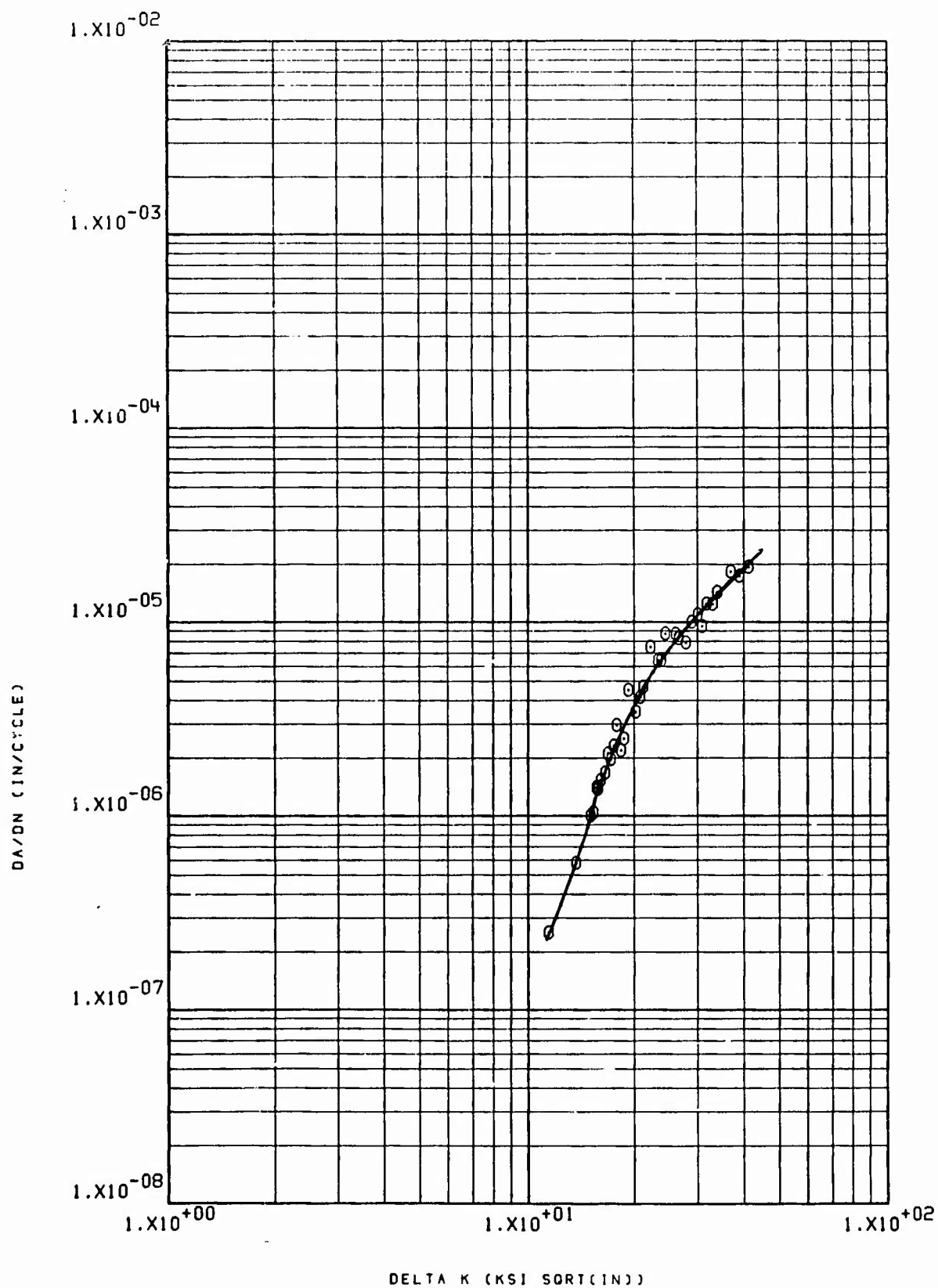
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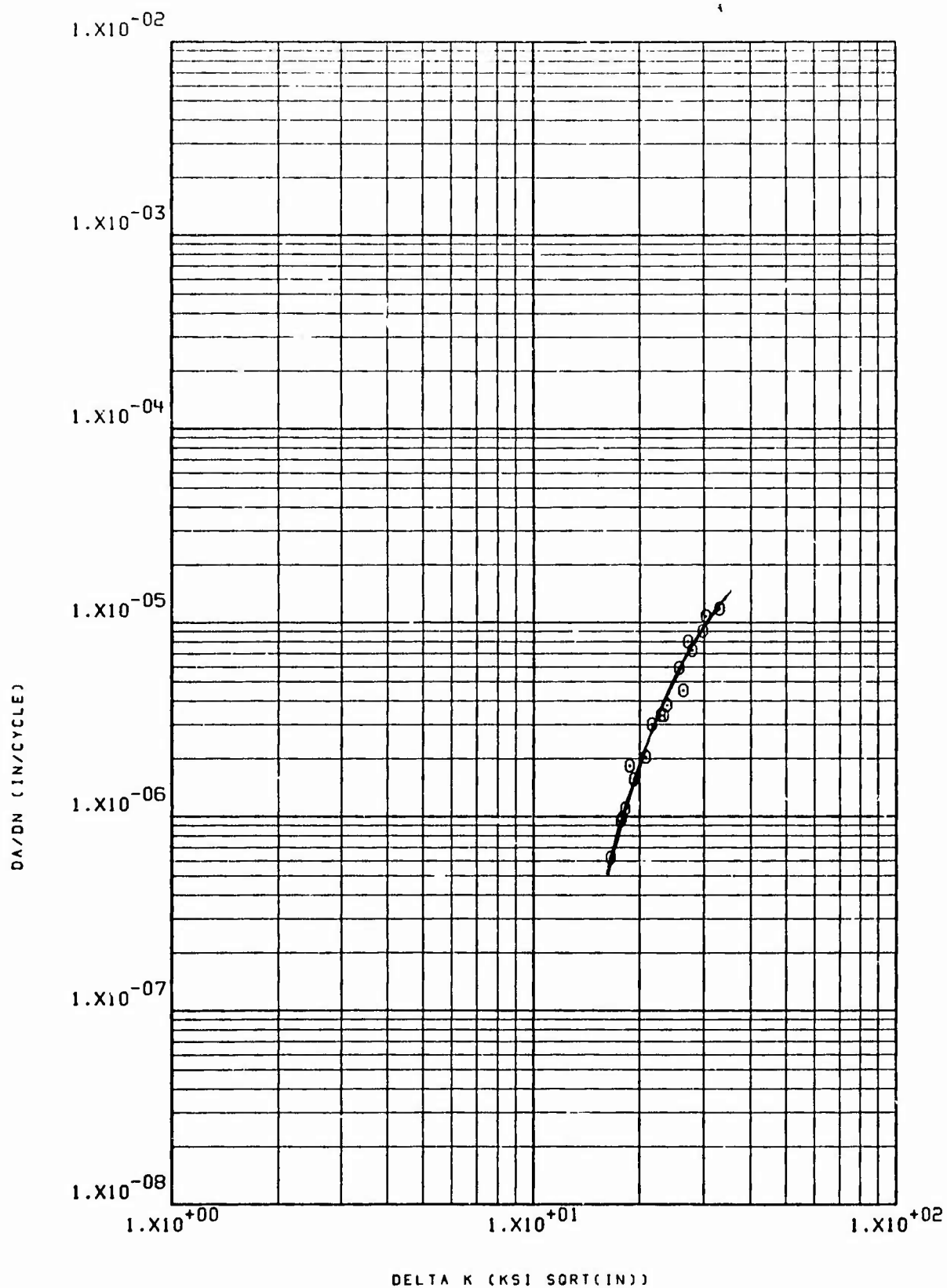


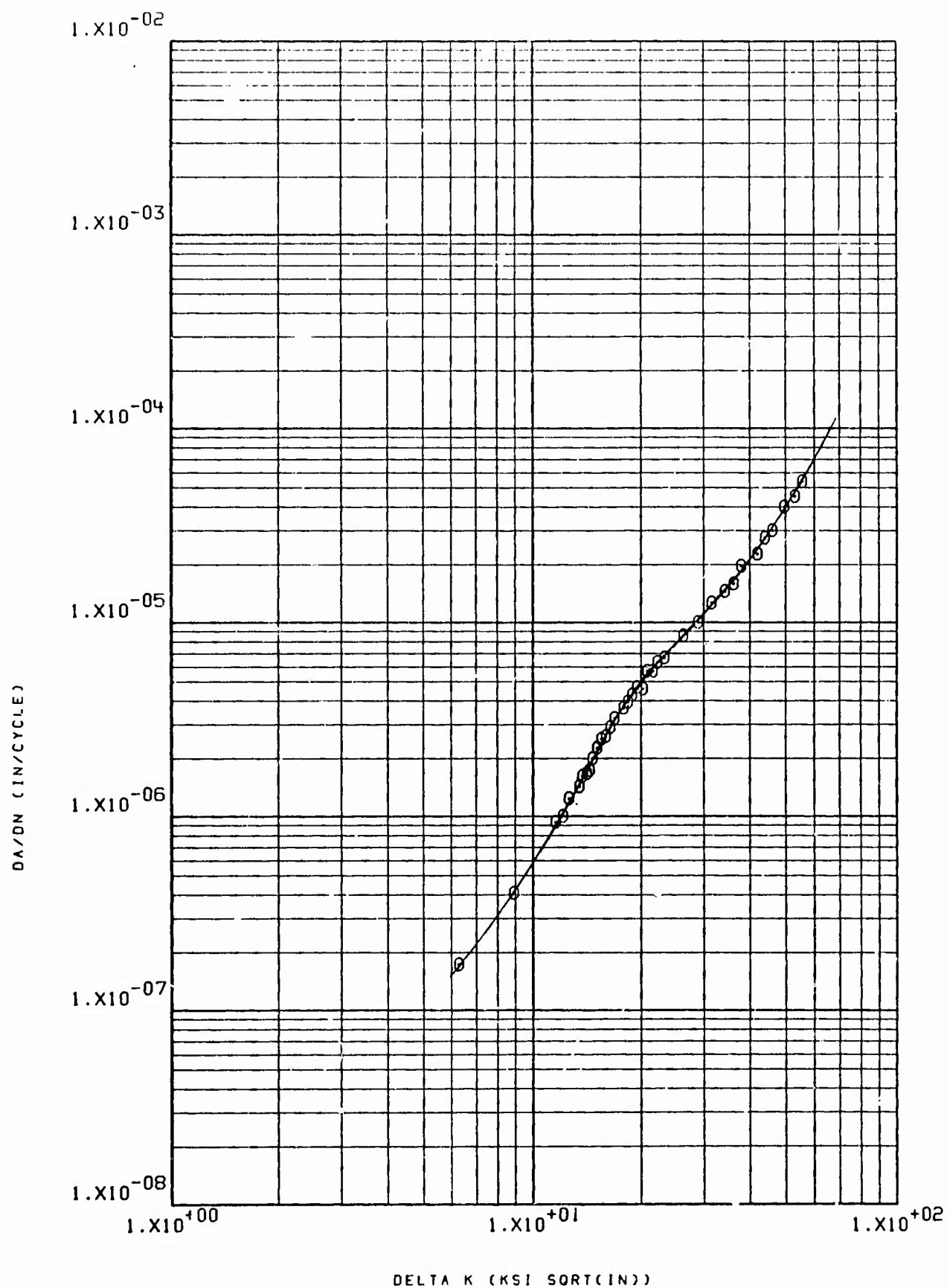


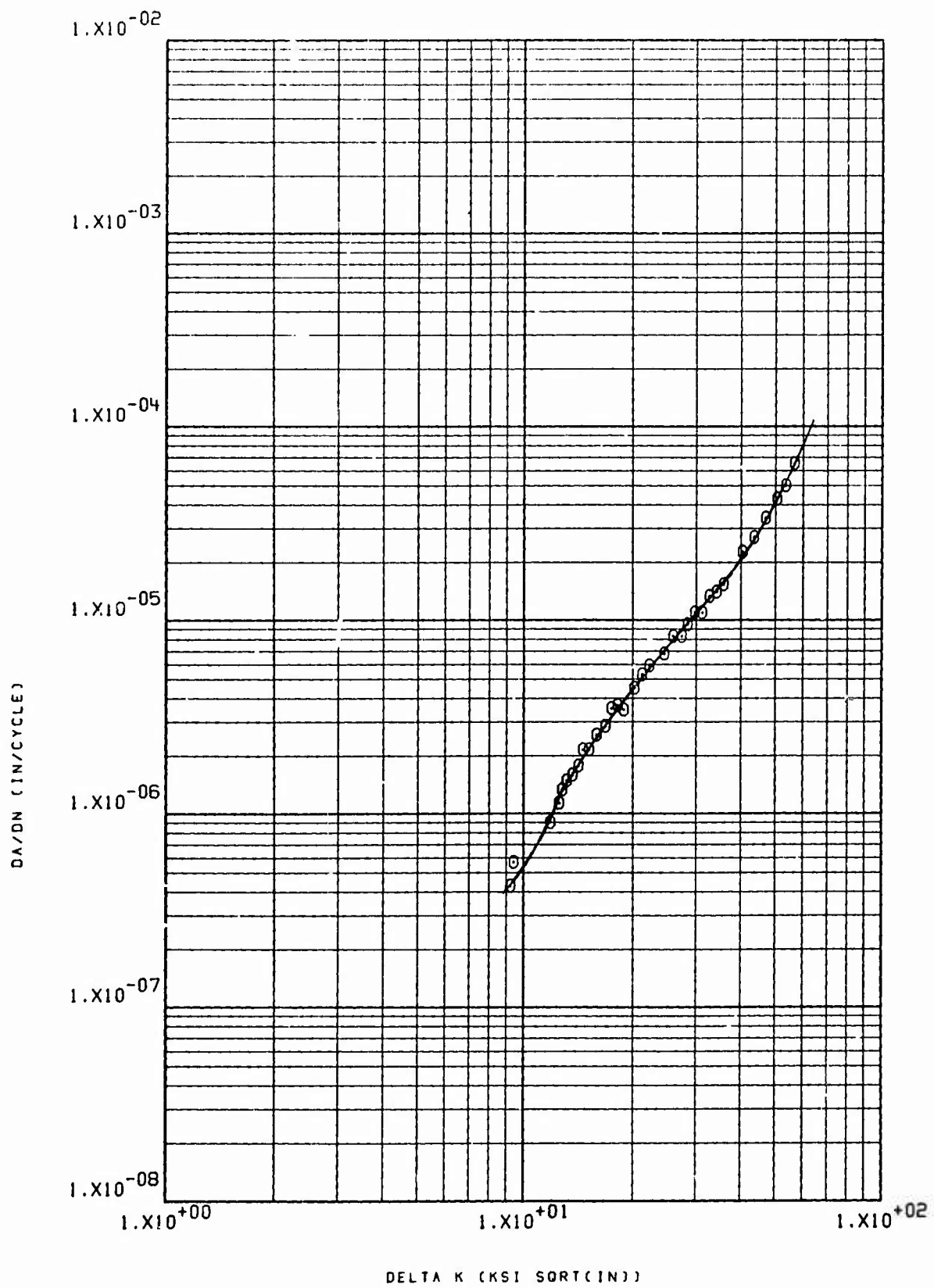
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C-94

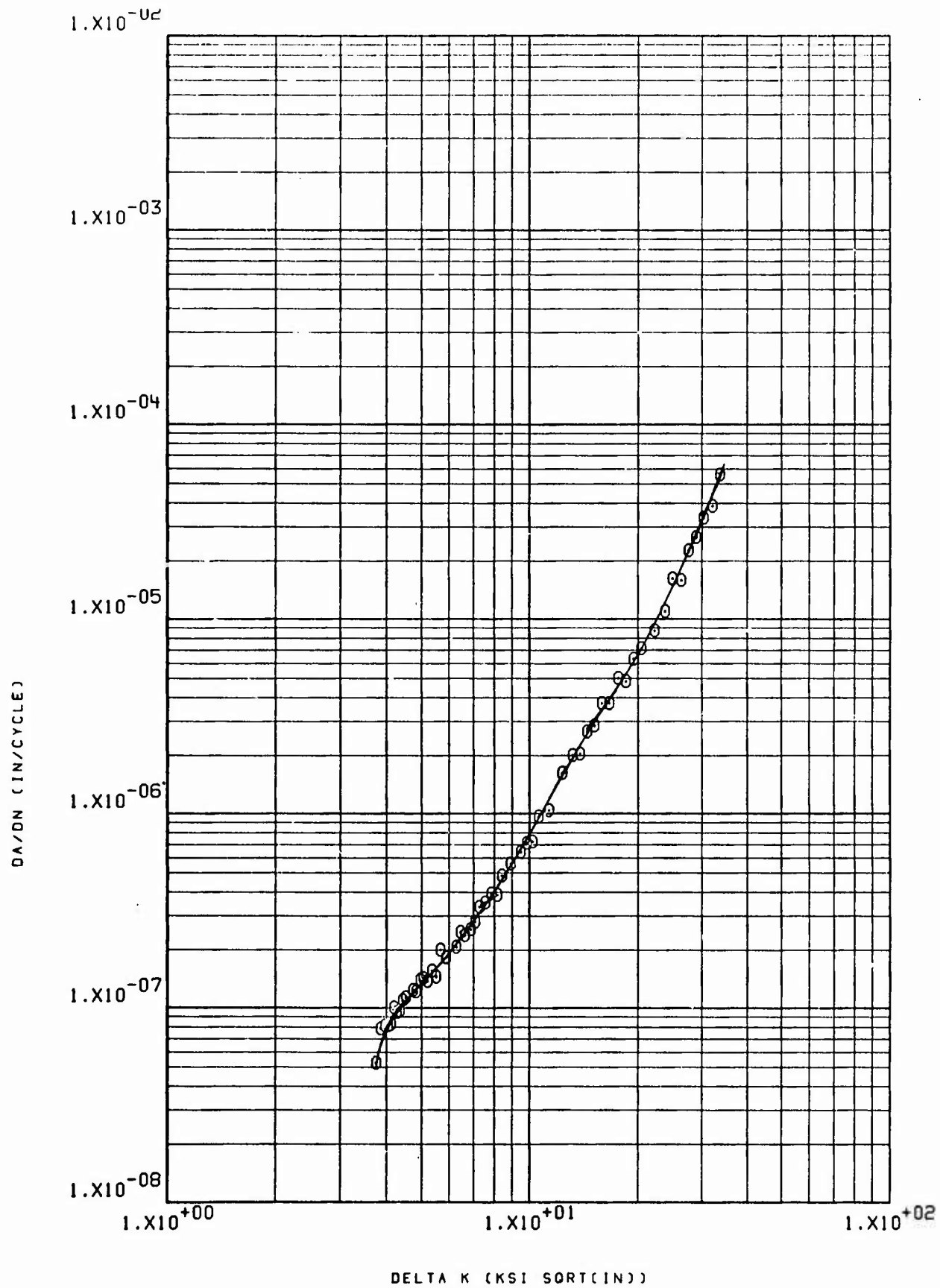




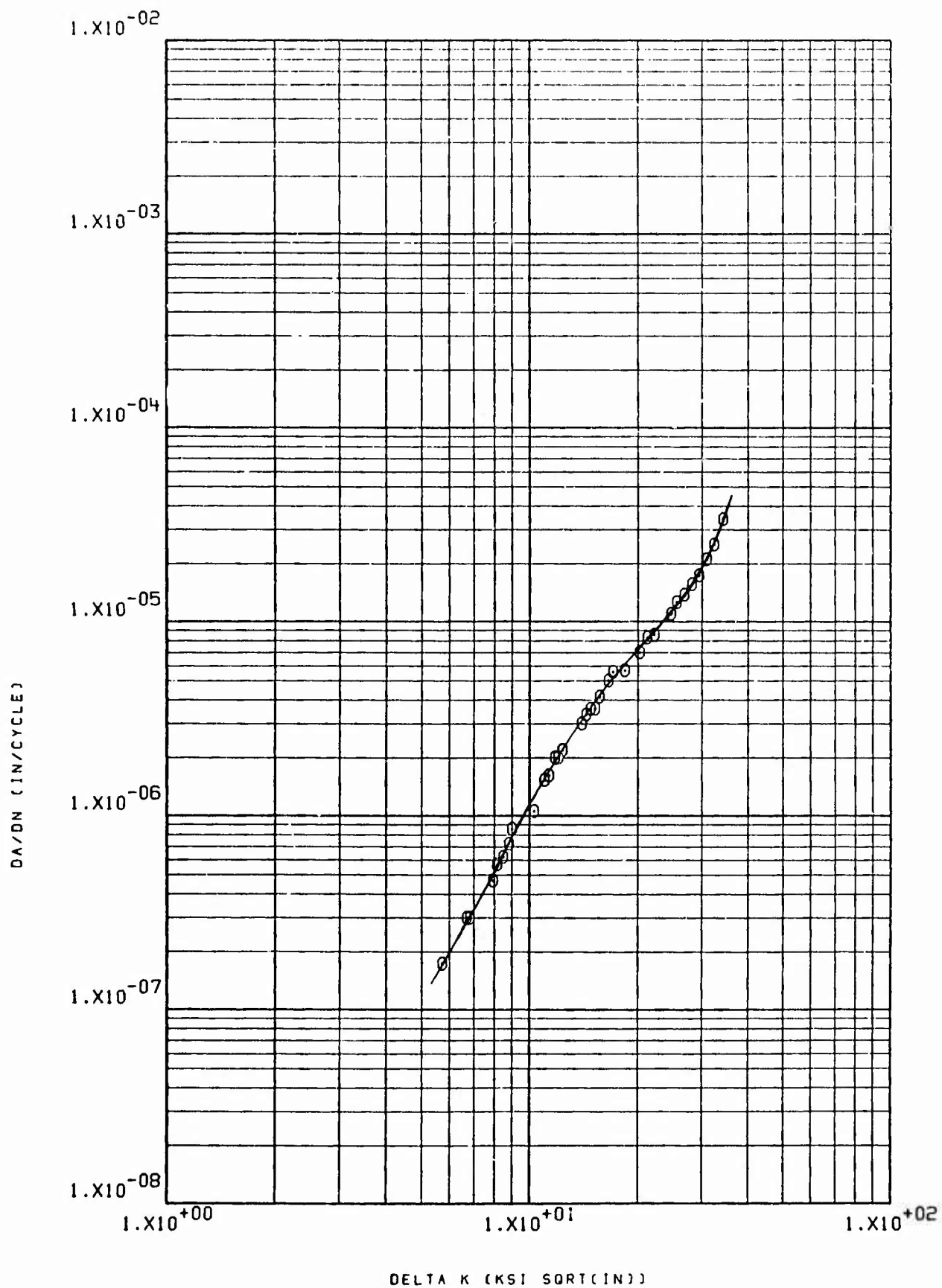


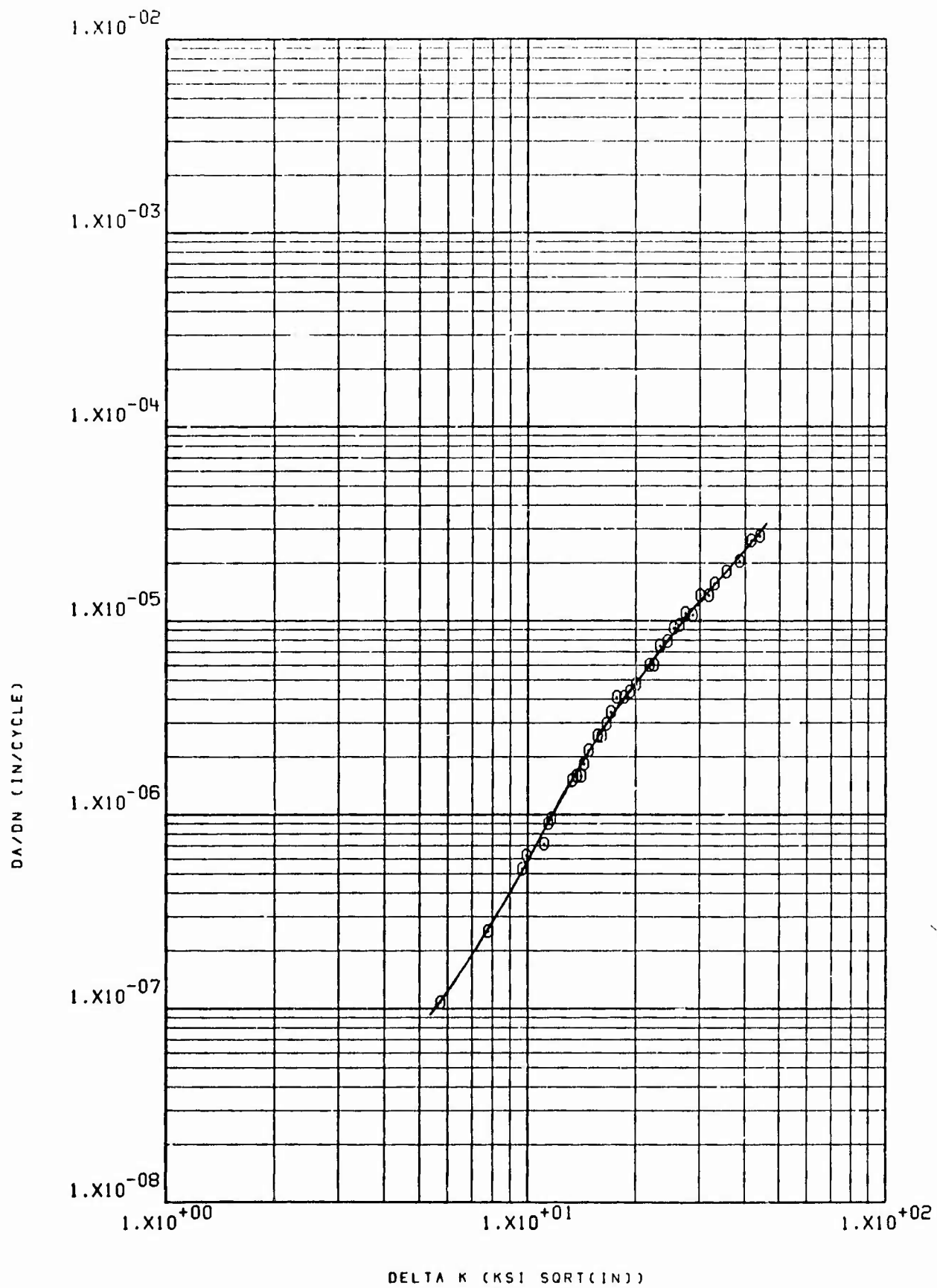


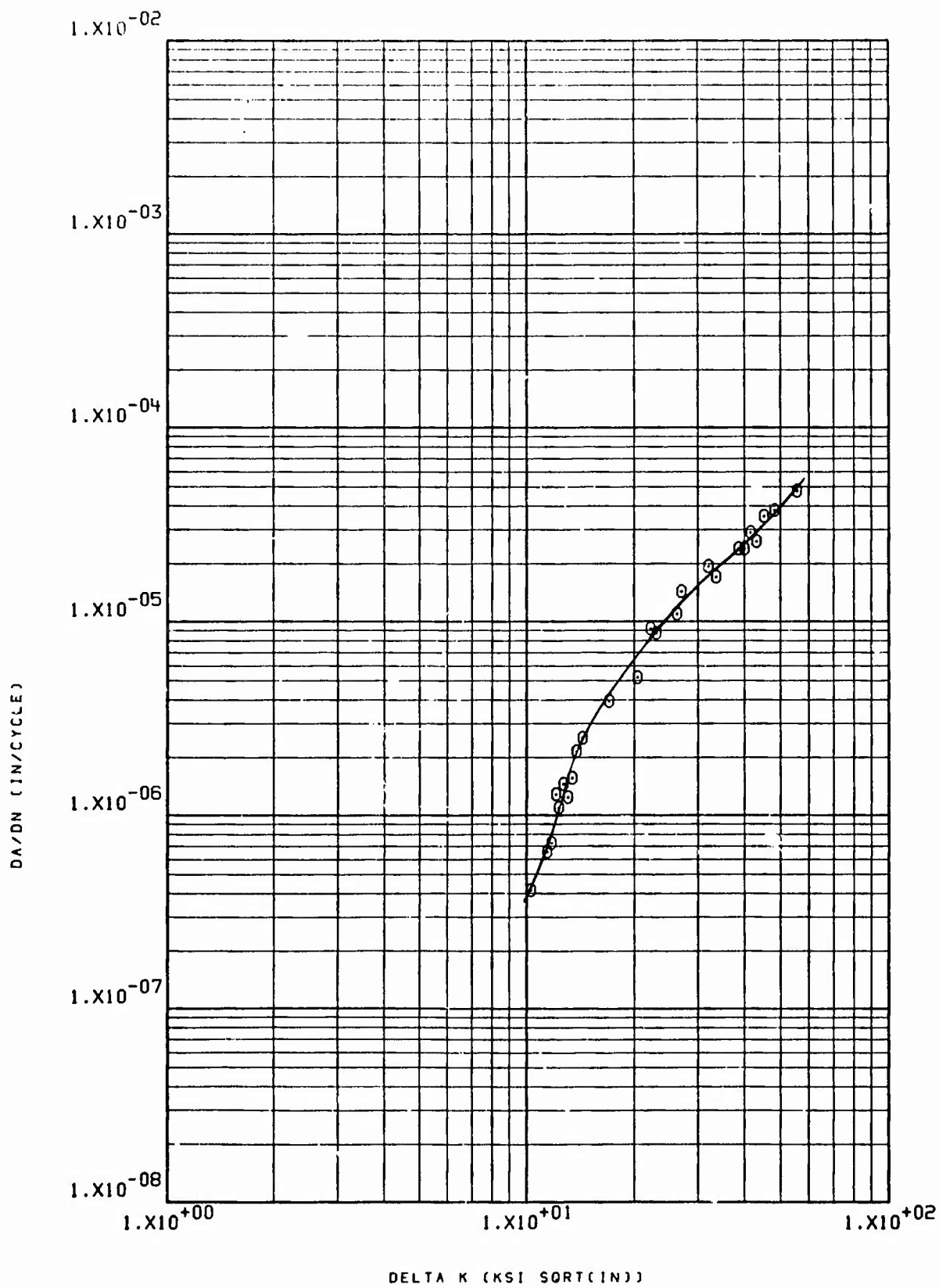
43 NRW 60-3 HP9-4-20 HT LHA RT 60CPM R=.08



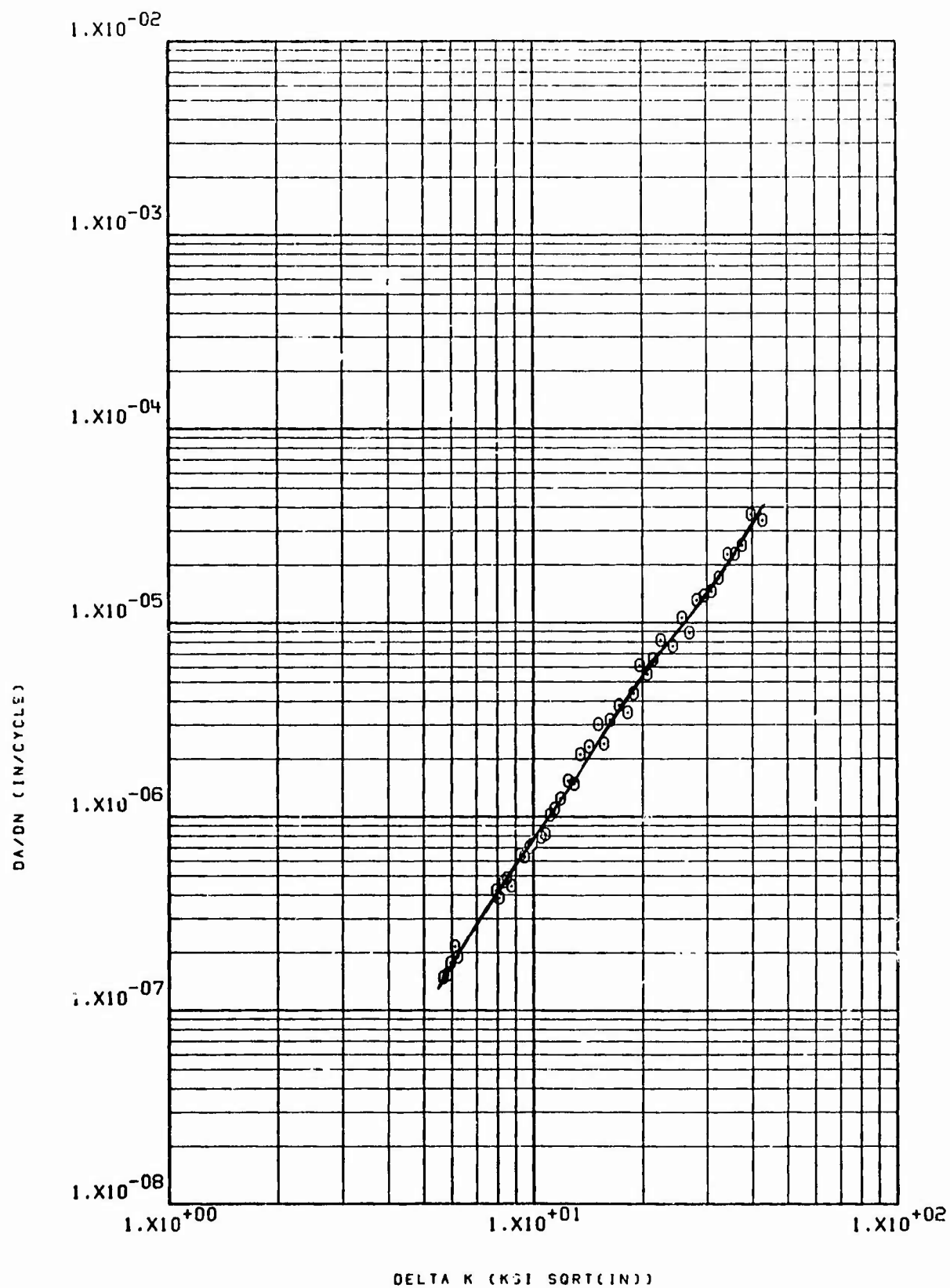
43 NRW 60-5 HP-9-4-.20 HT R.T. LHA 540CPM R=.08



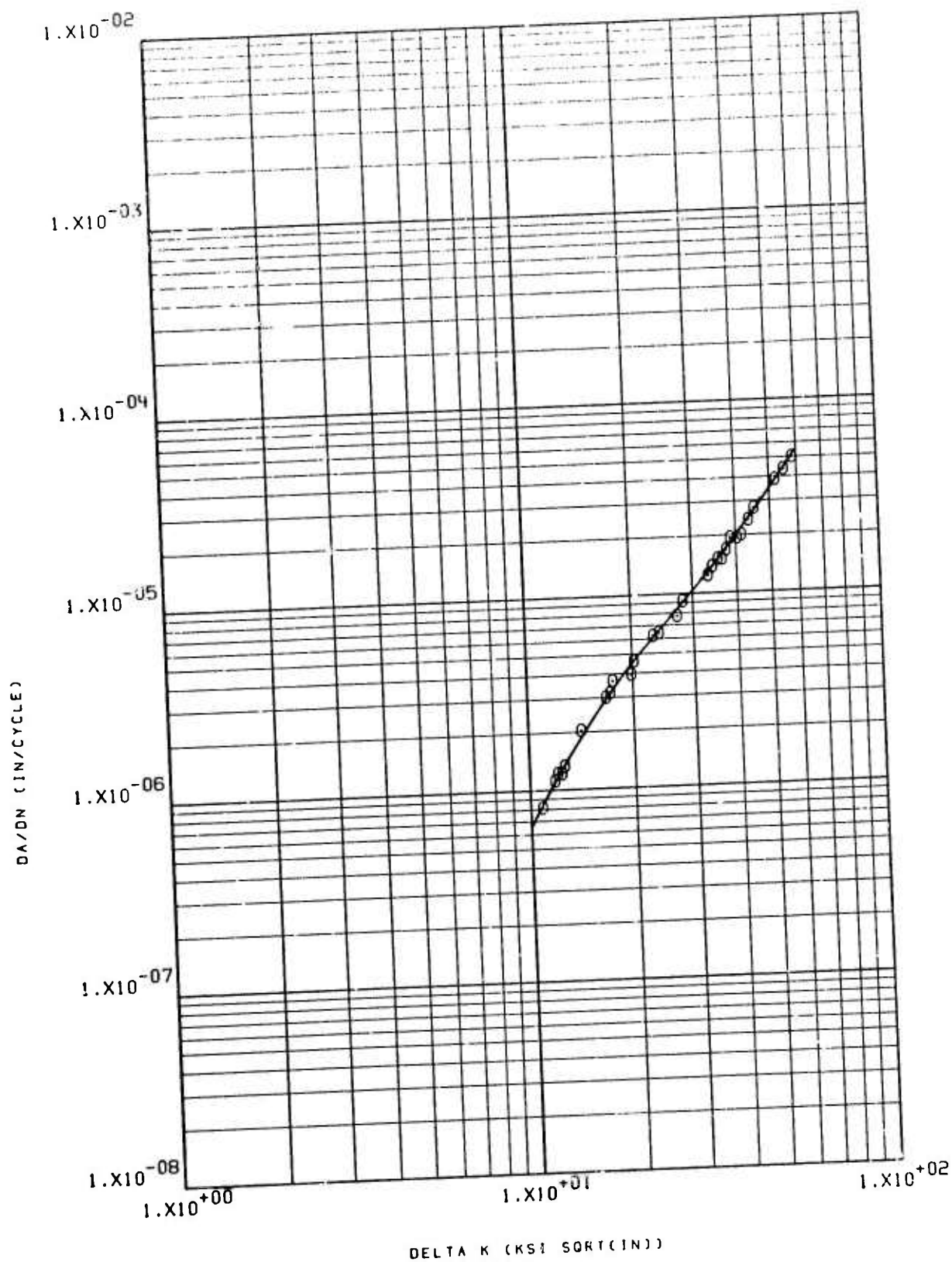




43 NRW 60-53 HP 9-4-20 HT 1000 HUMIDITY RT R=.08 6CPH

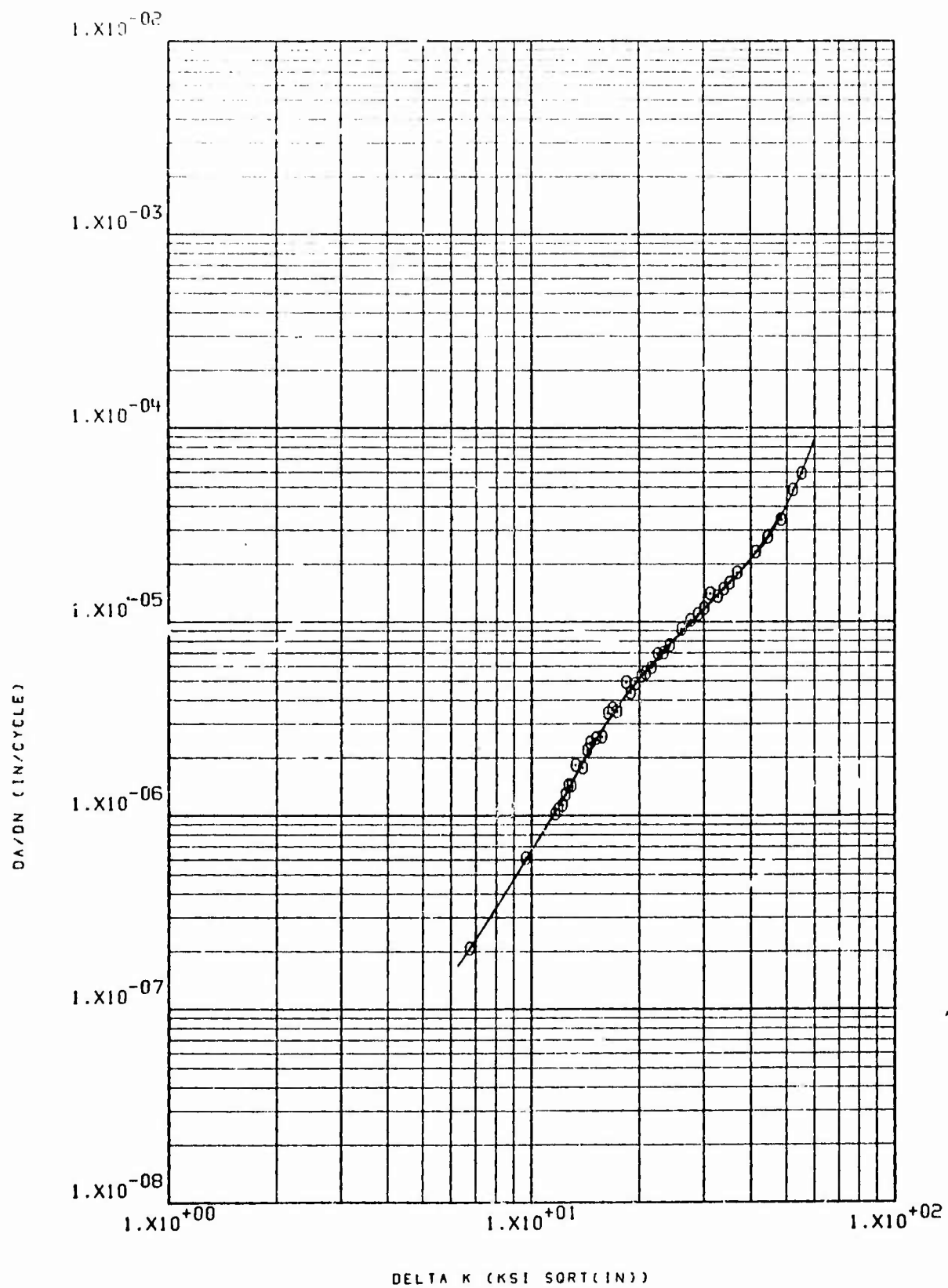


43 NRW 60-55 HP-9-4-.20 HT STW RT R=.08 60 CPM

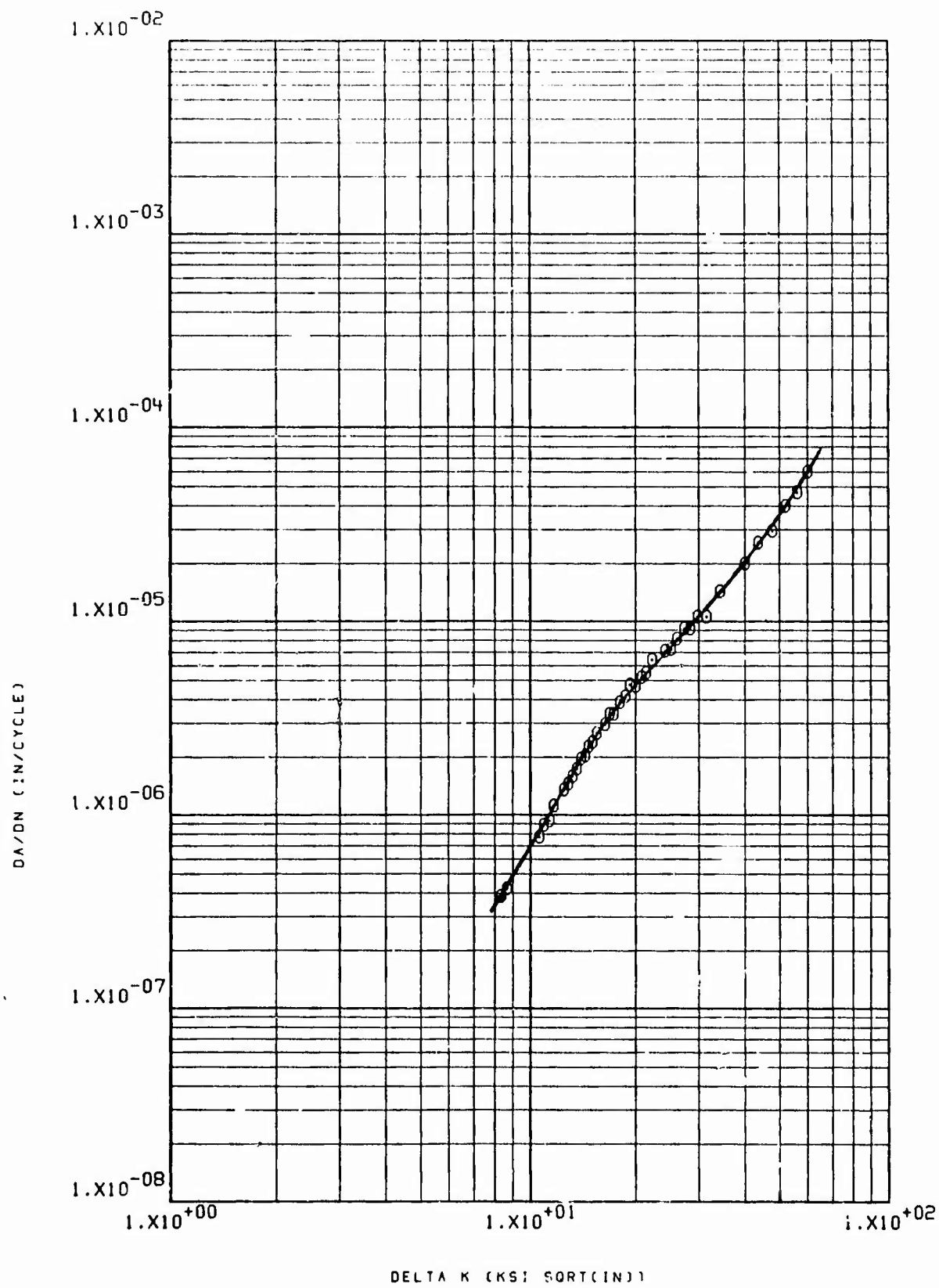


43 NRW 60-57 HP 9-4-20 HT LHA R1 R=.08 6CPM

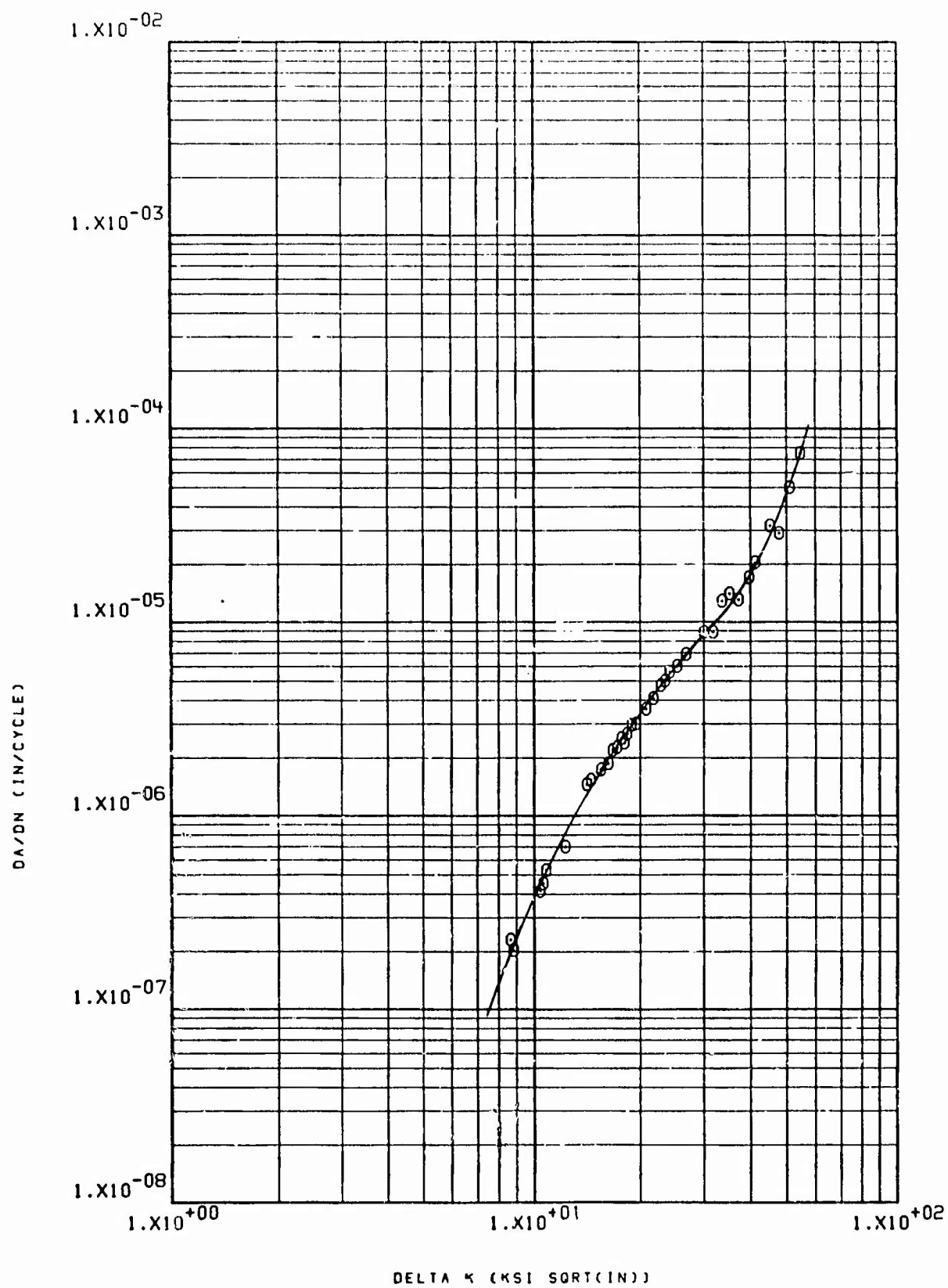
C-104



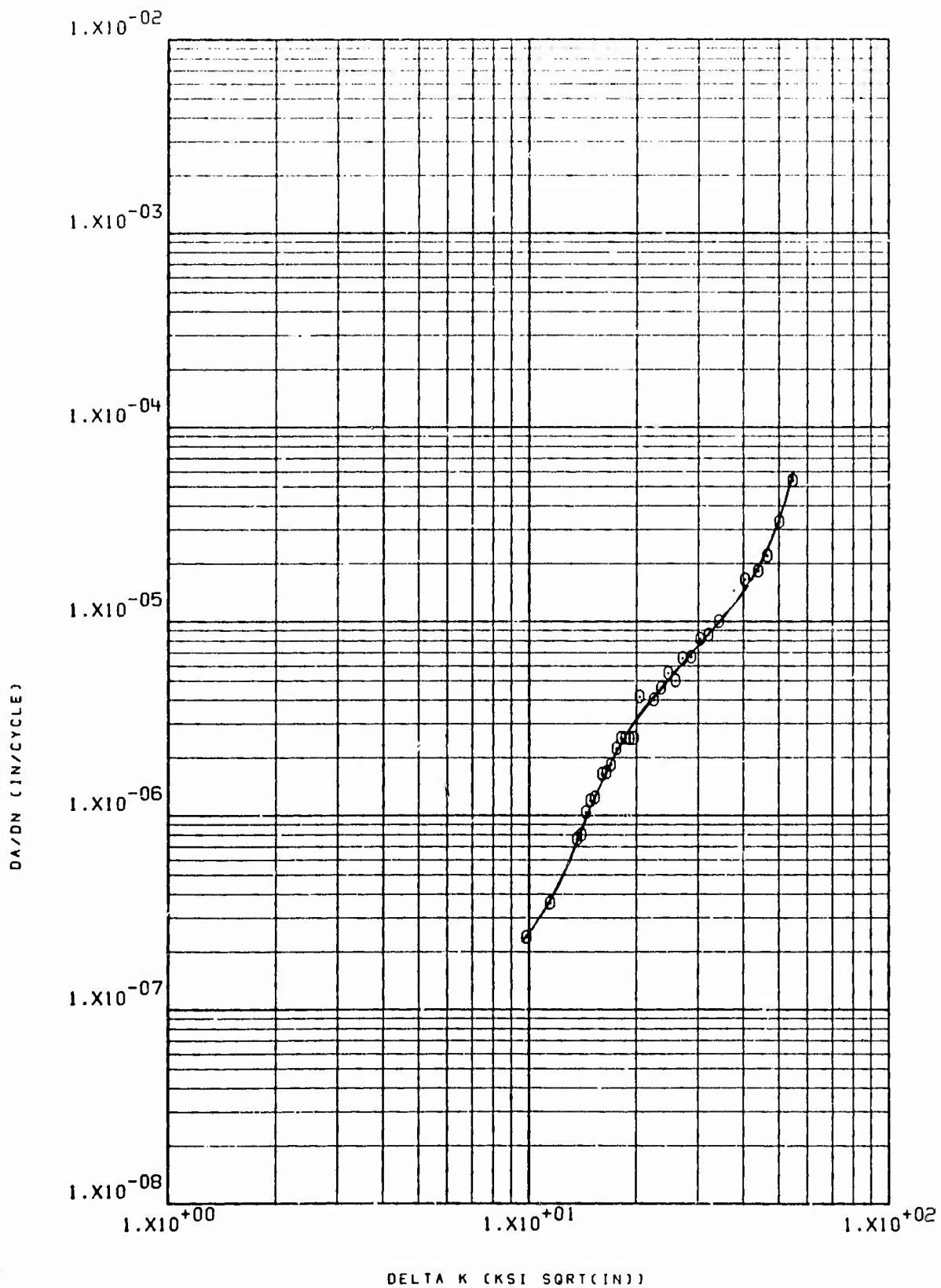
43 NRW 60-59 HP3-4-20 HT LHA PT 360CPM R=.08

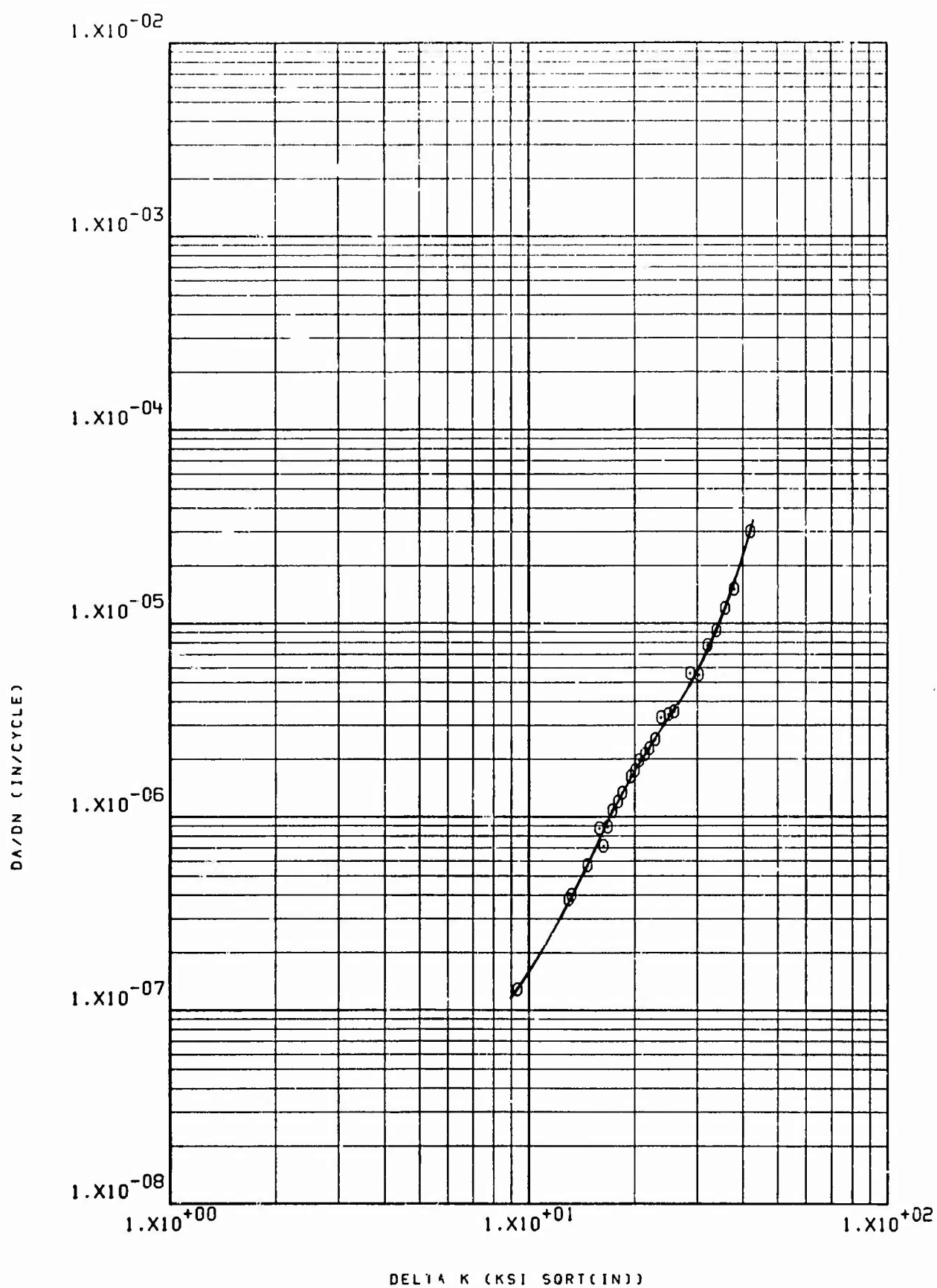


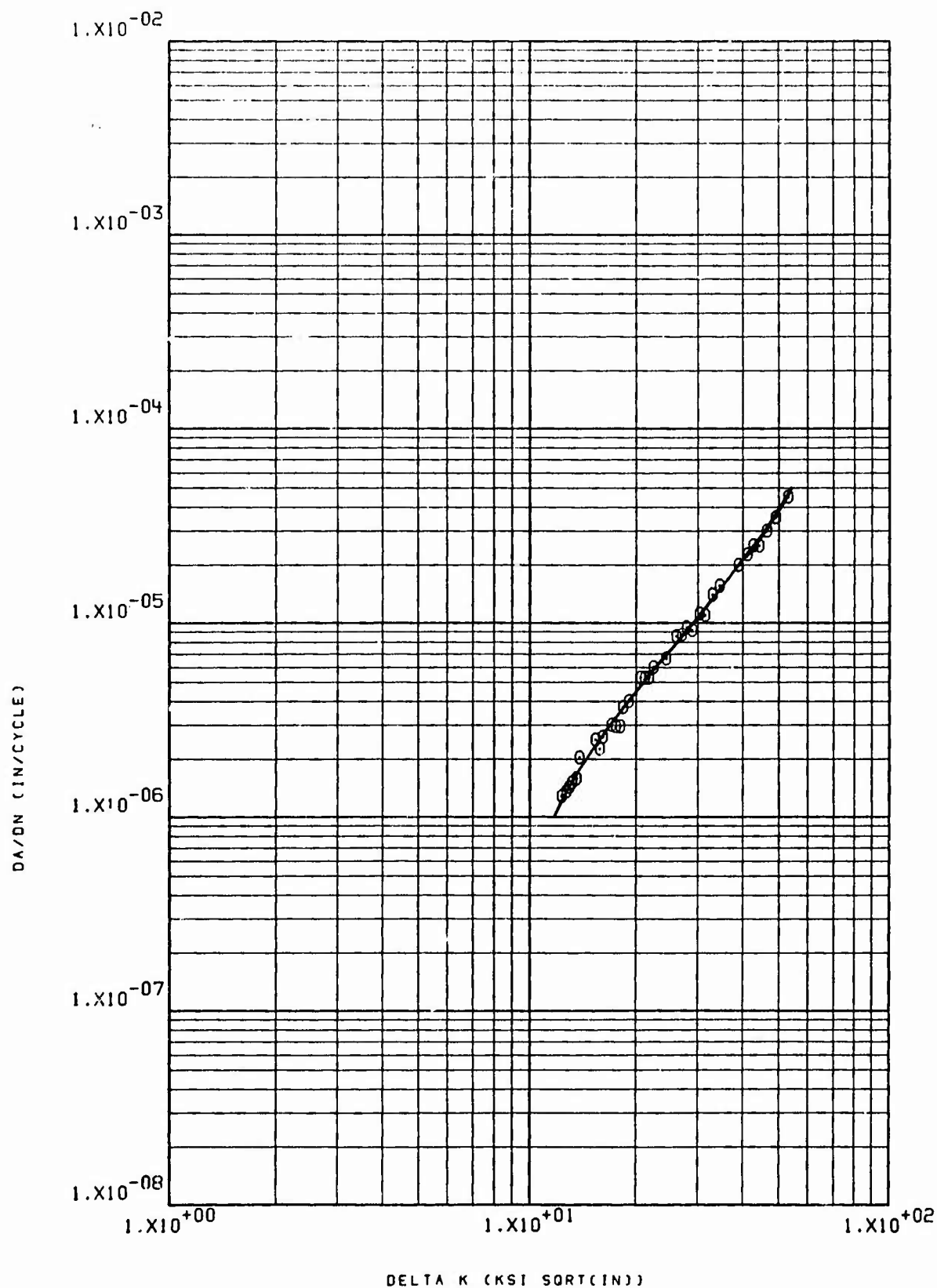
43NRW60-61 HP9-4-20 HT LHA RT J60CPM R=.08



44NRW62-8 PH13-8 H-1000 LHA RT 360CPH R=.08

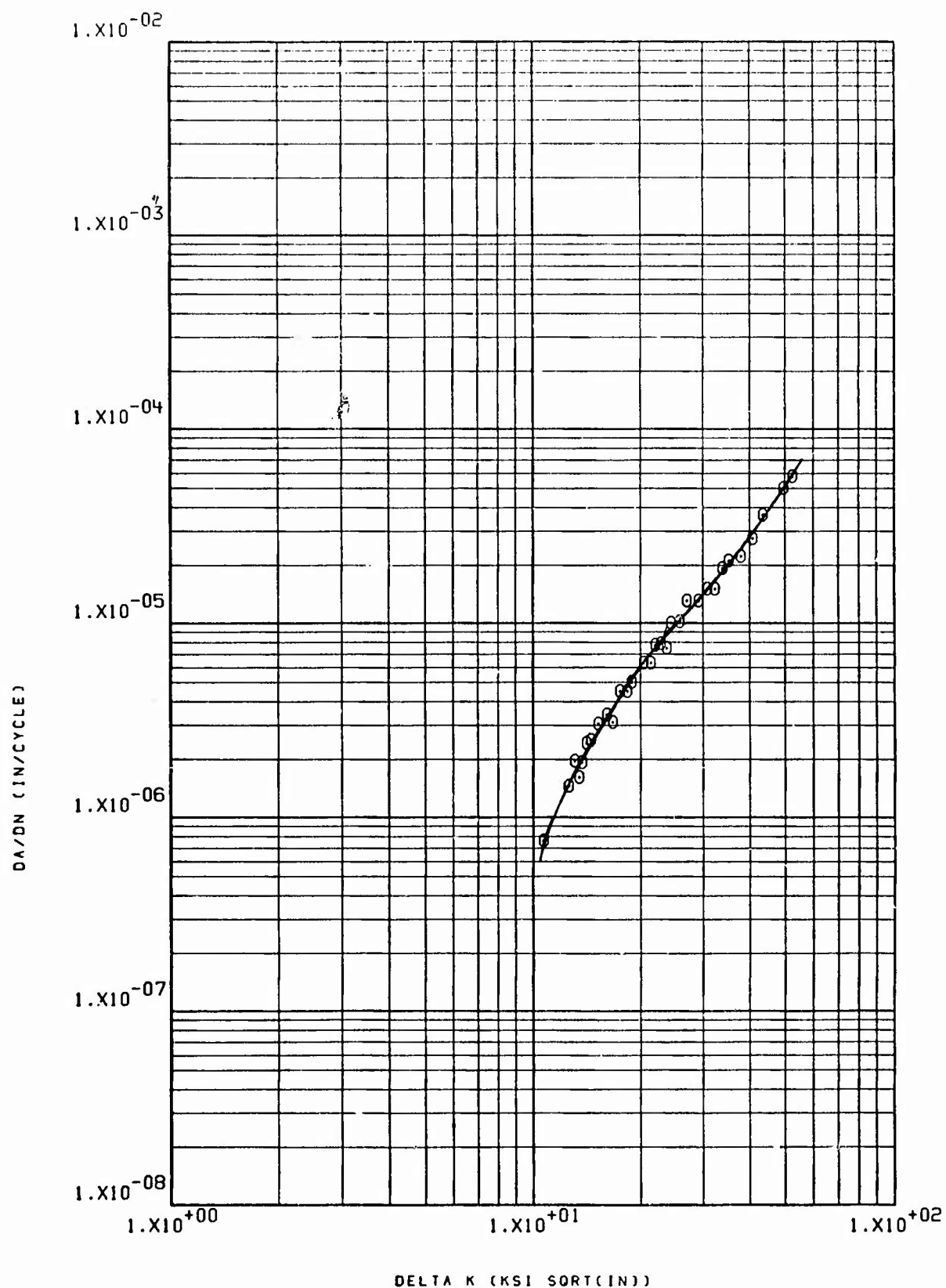






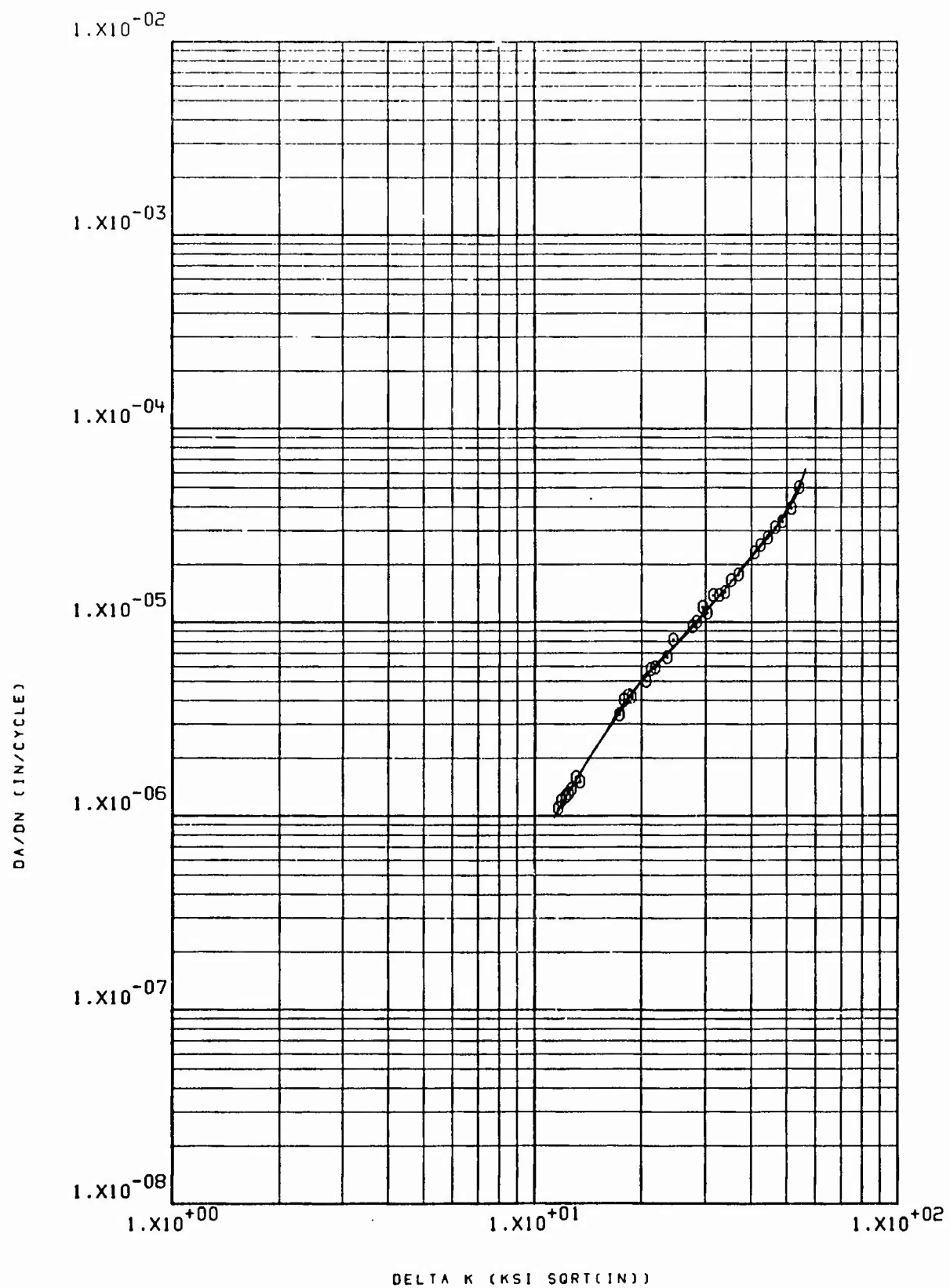
46 NRW 73-7 HP 9-4-20 VIM VAR LHA RT R=.08 360CPH

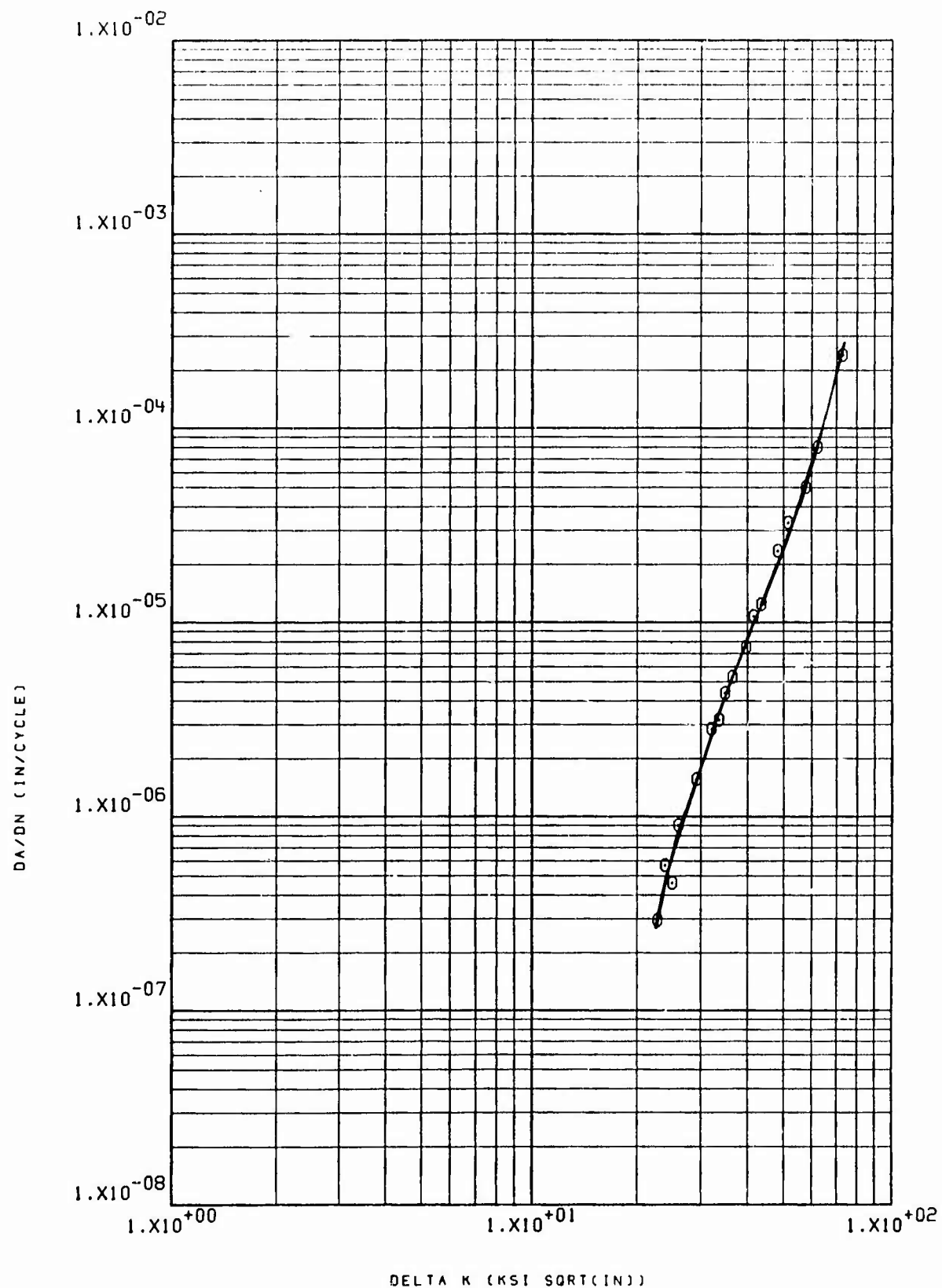
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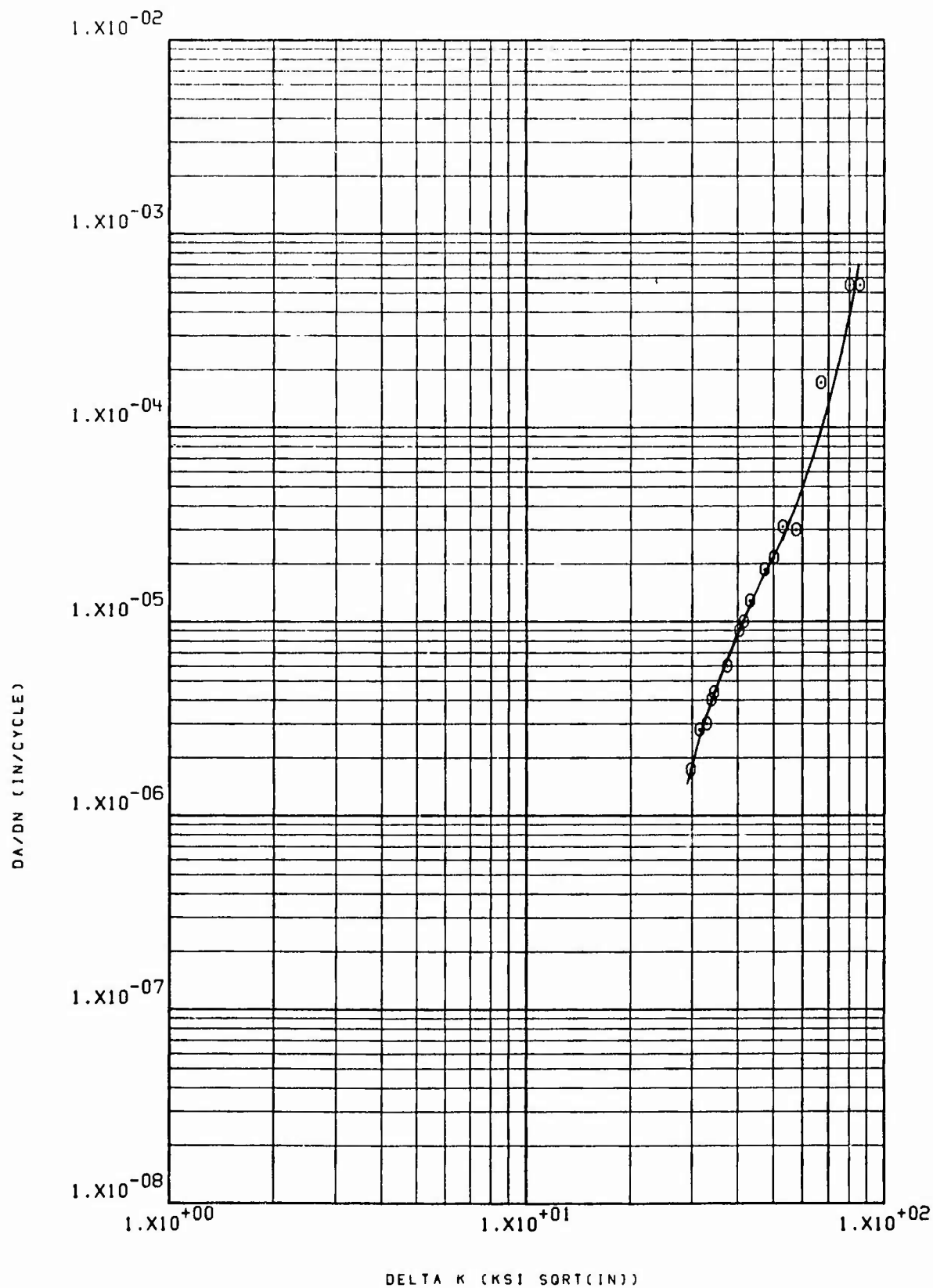


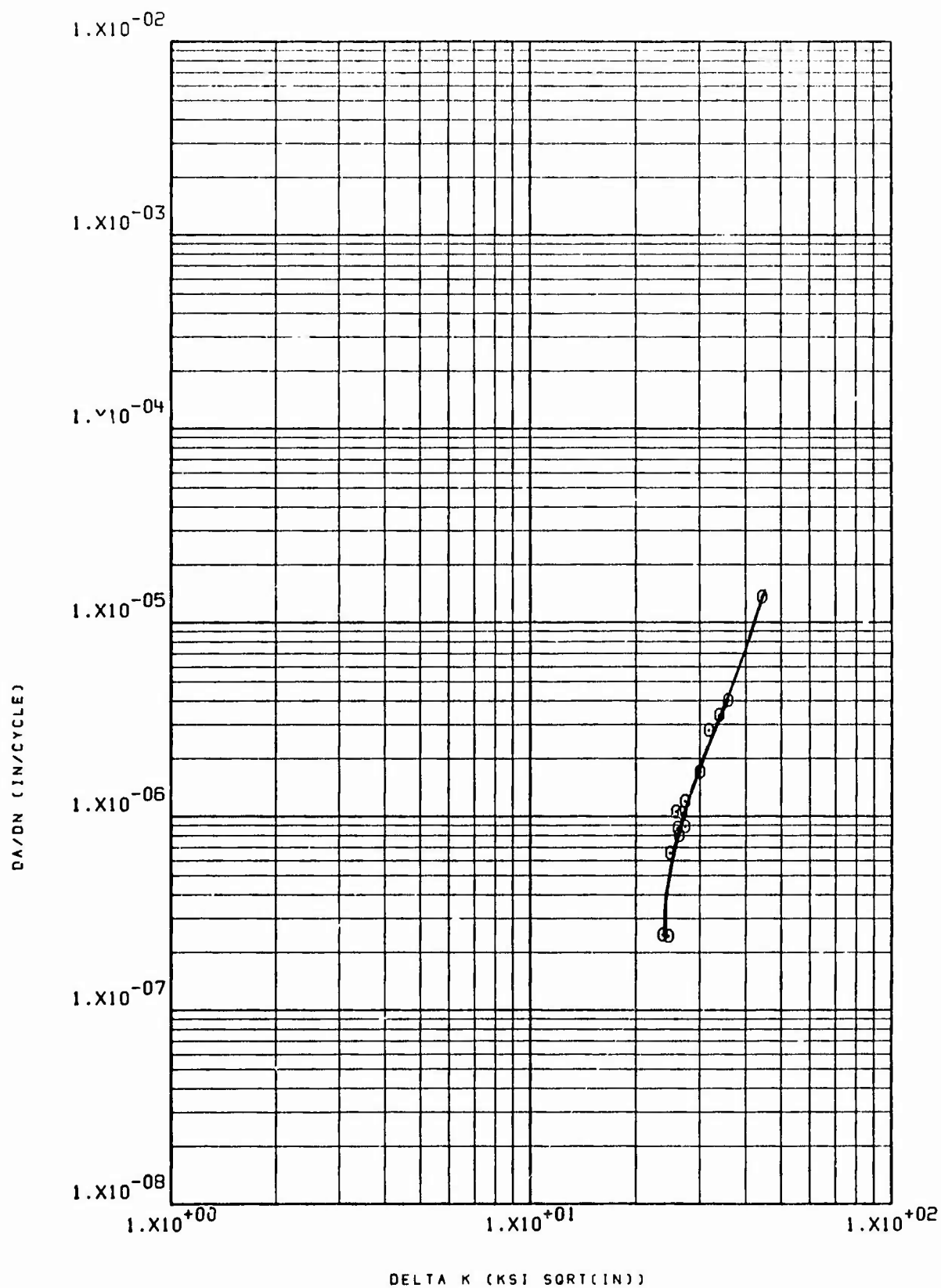
46 NRW 73-8 HP-9-4-20 VIM VAR 1000 HUMIDITY RT R=.08 60CPM

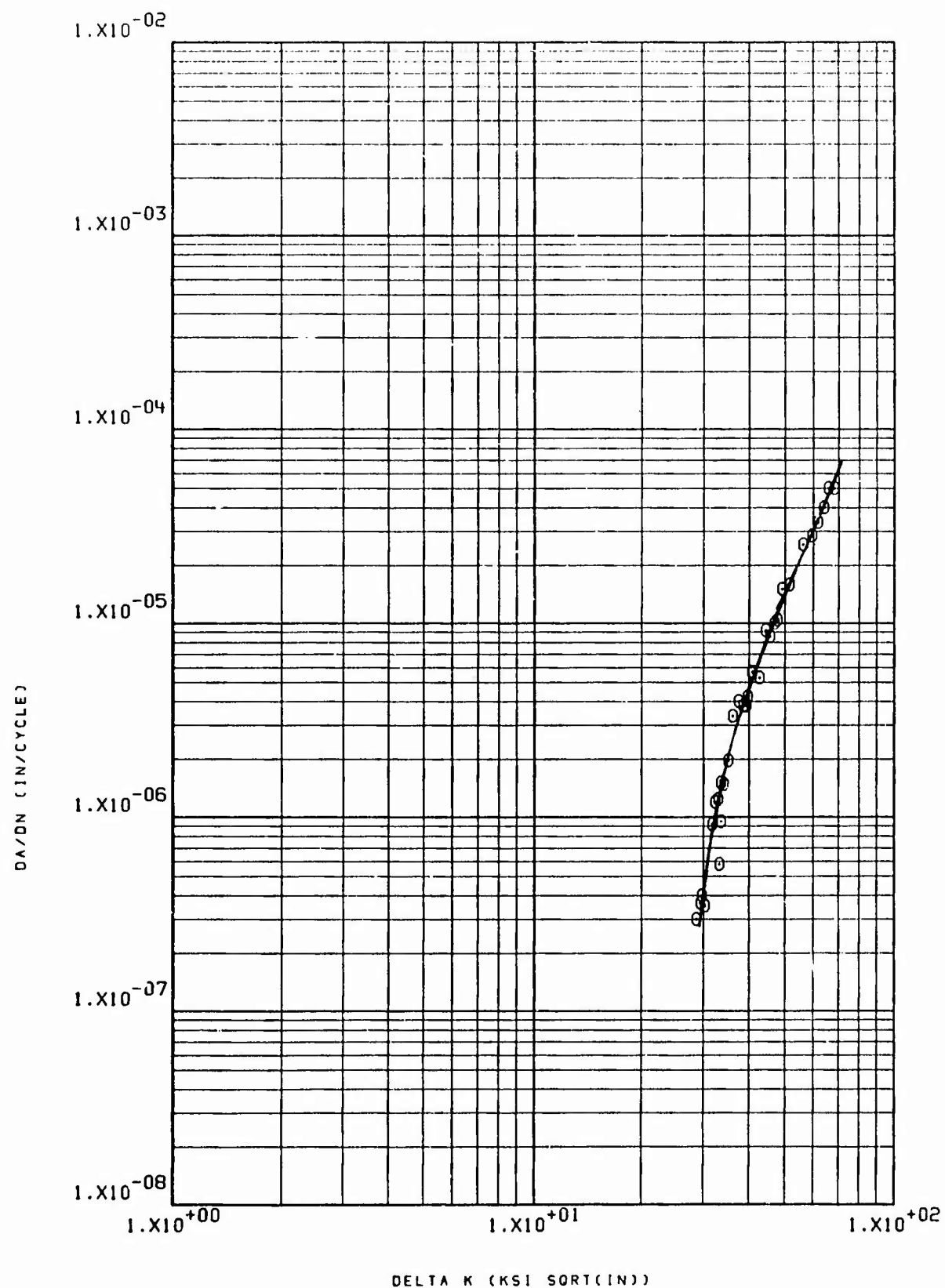
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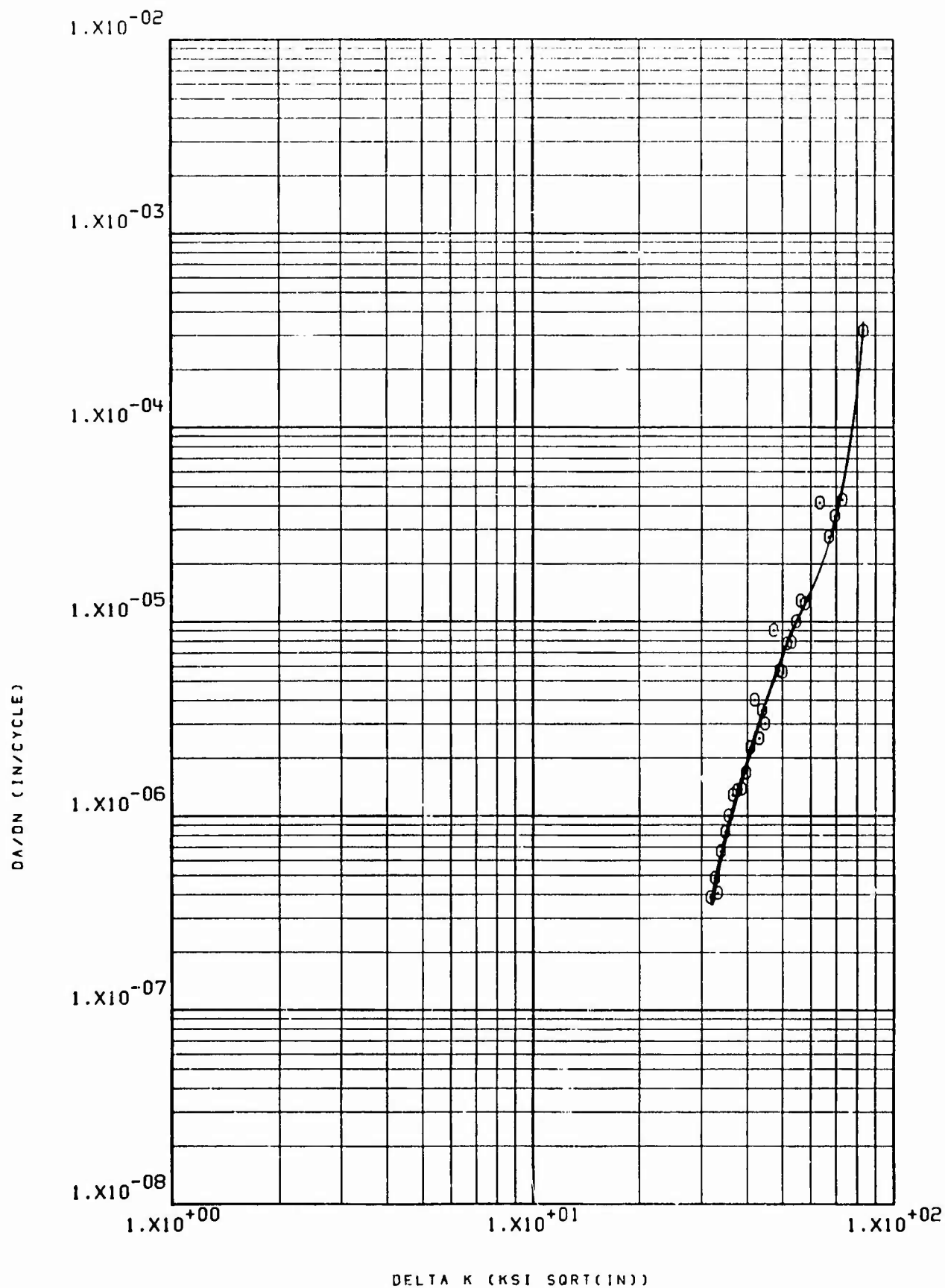


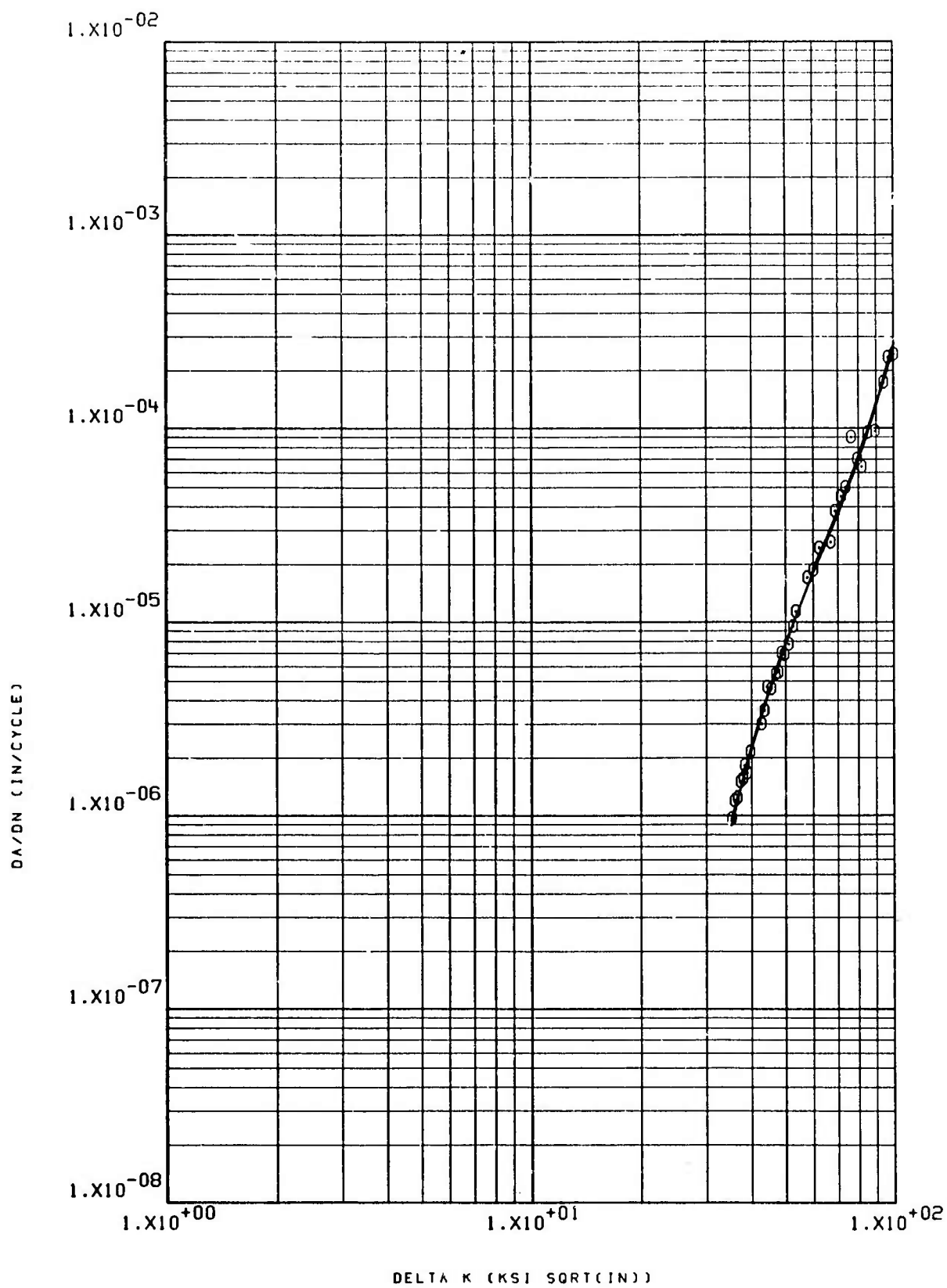


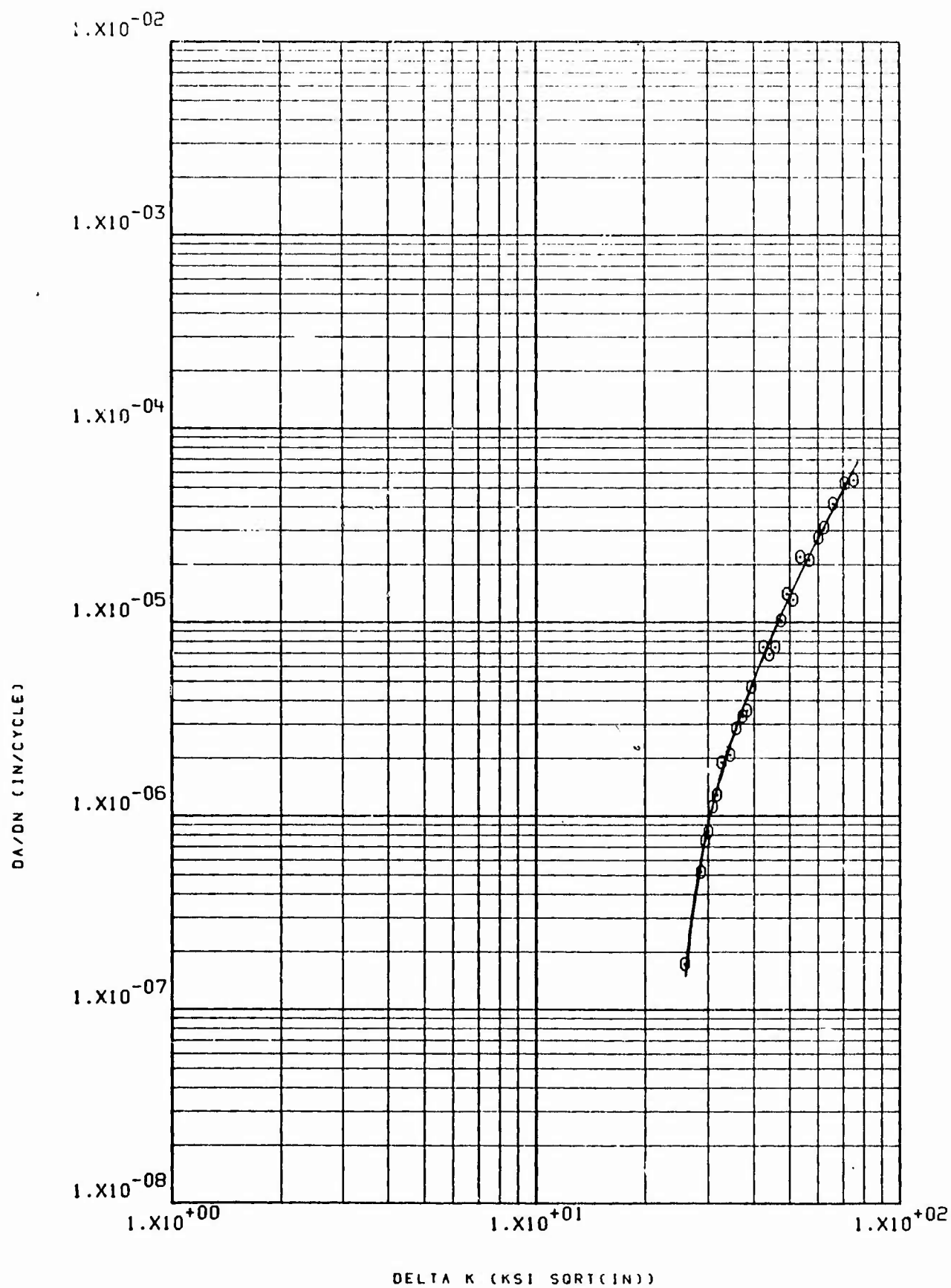


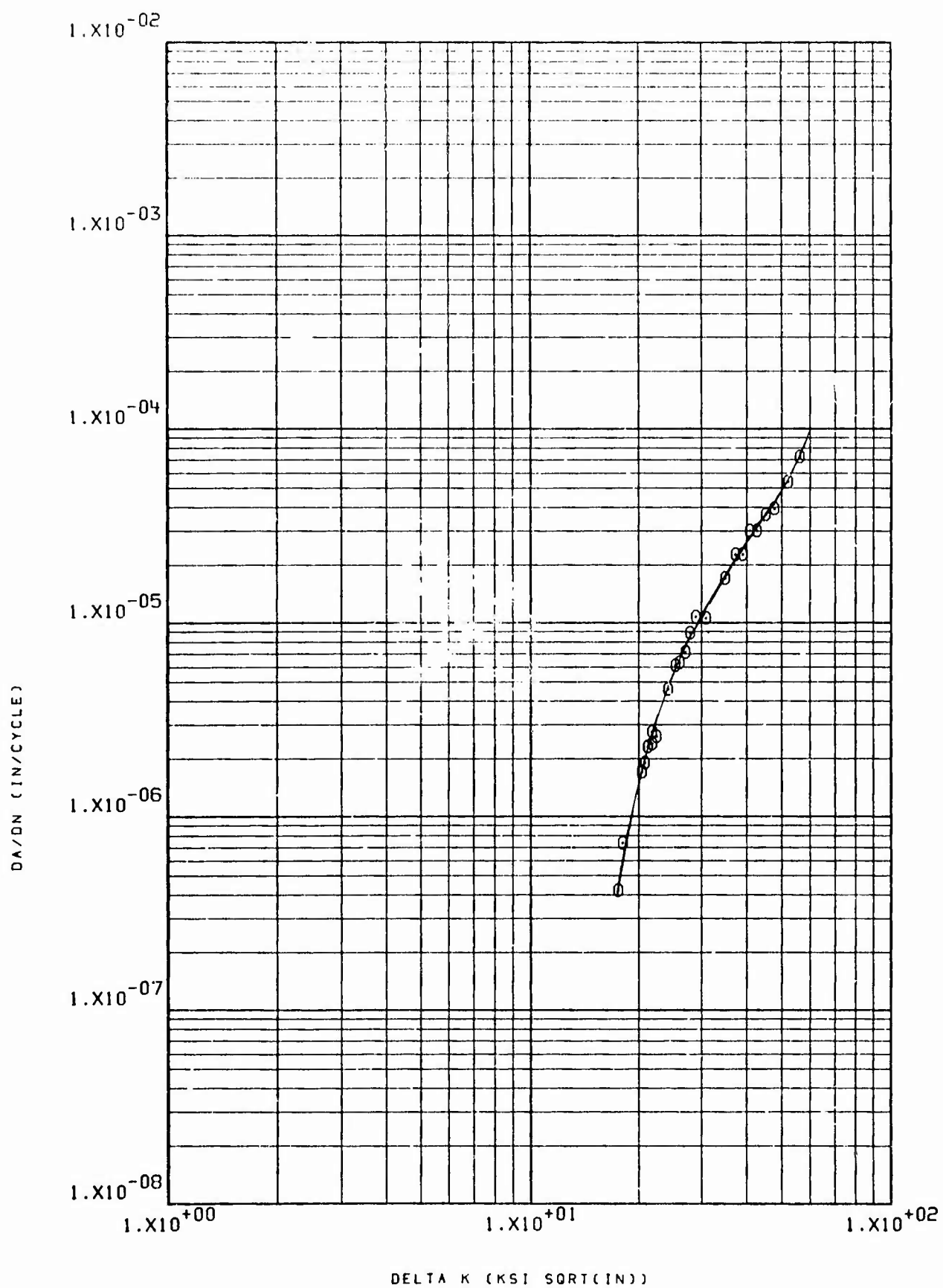






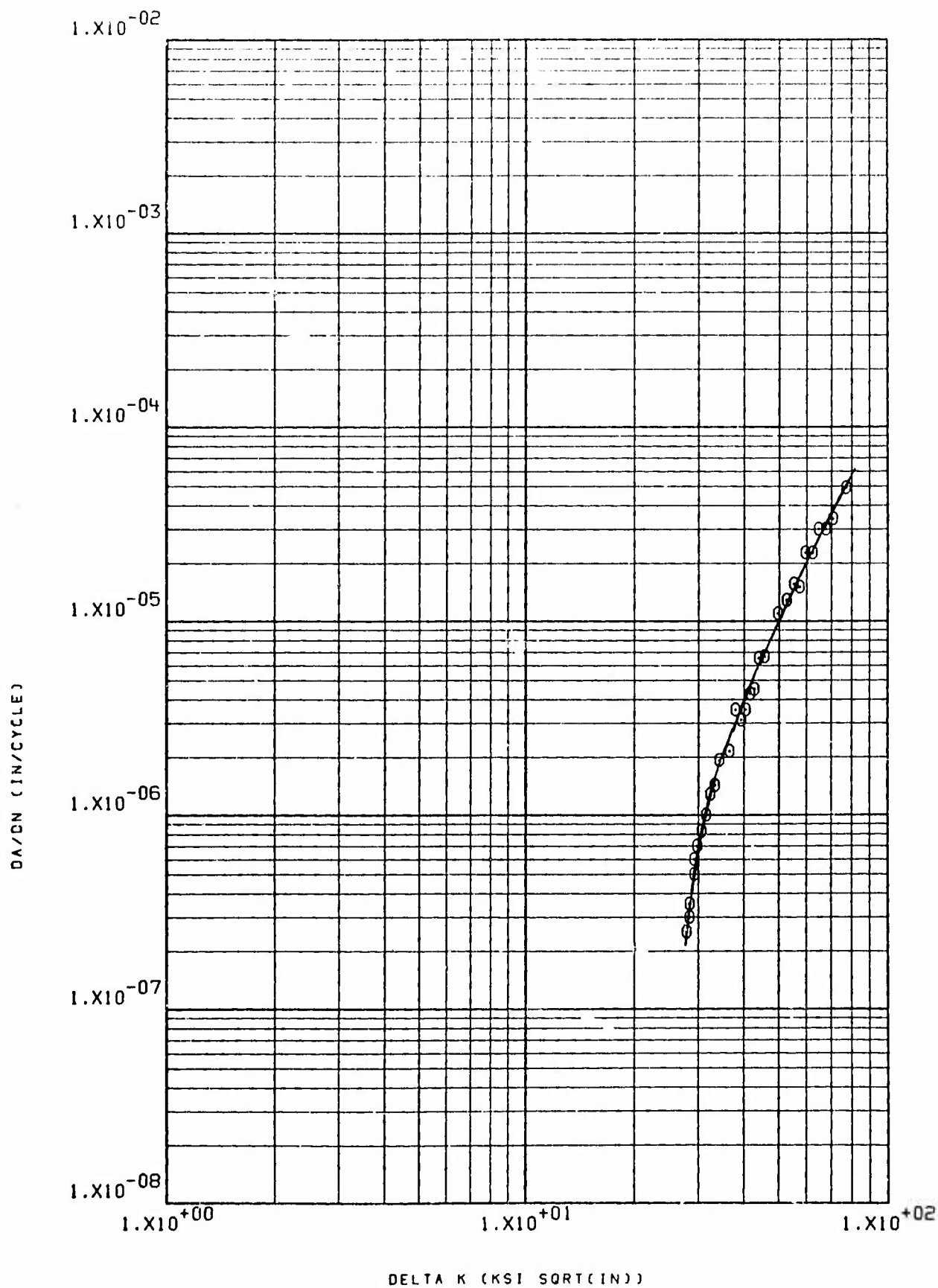


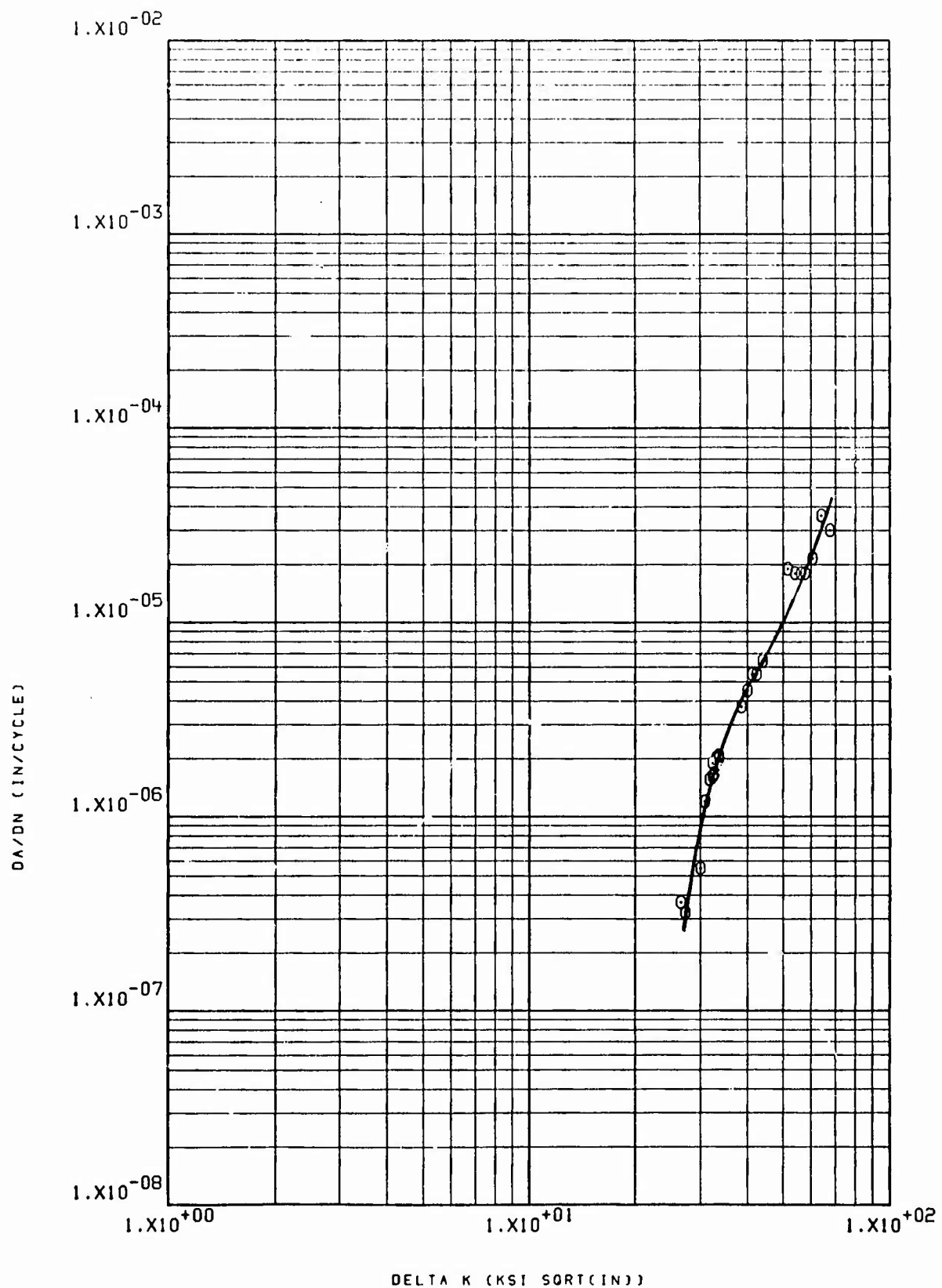


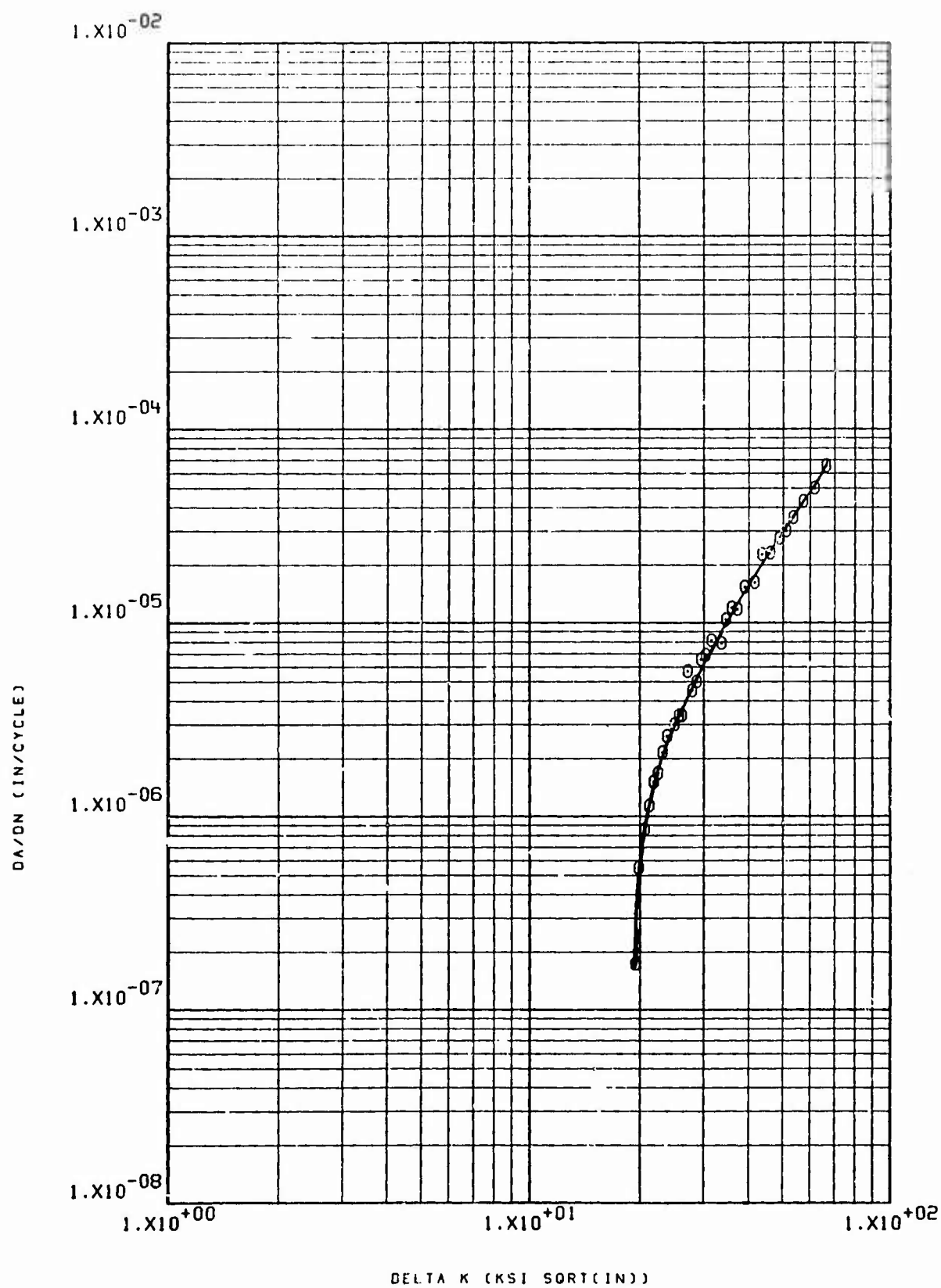


51 NRW 82-54 INCONEL 718 H.T. LHA 400 360CPH R=.5

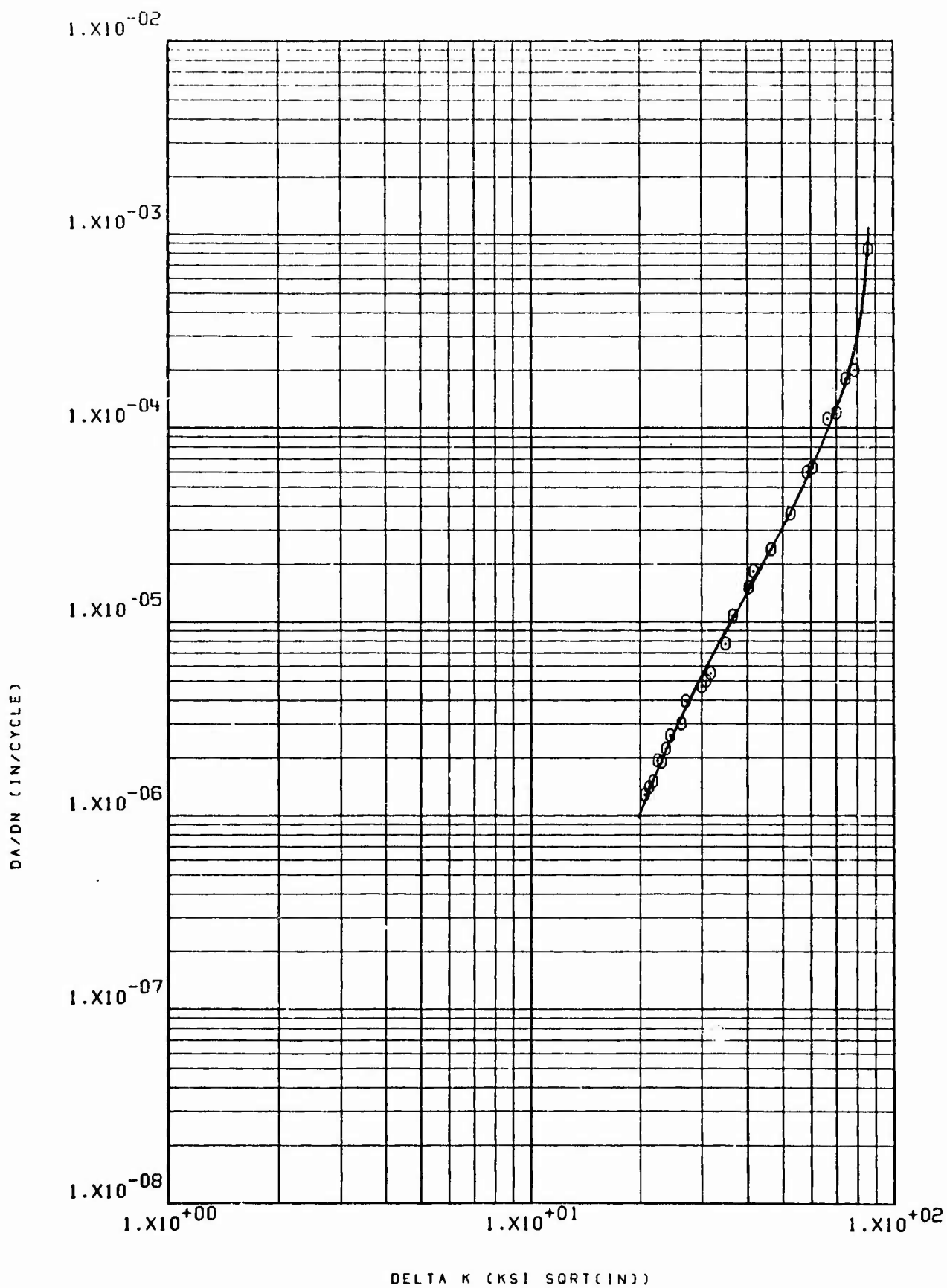
C-120

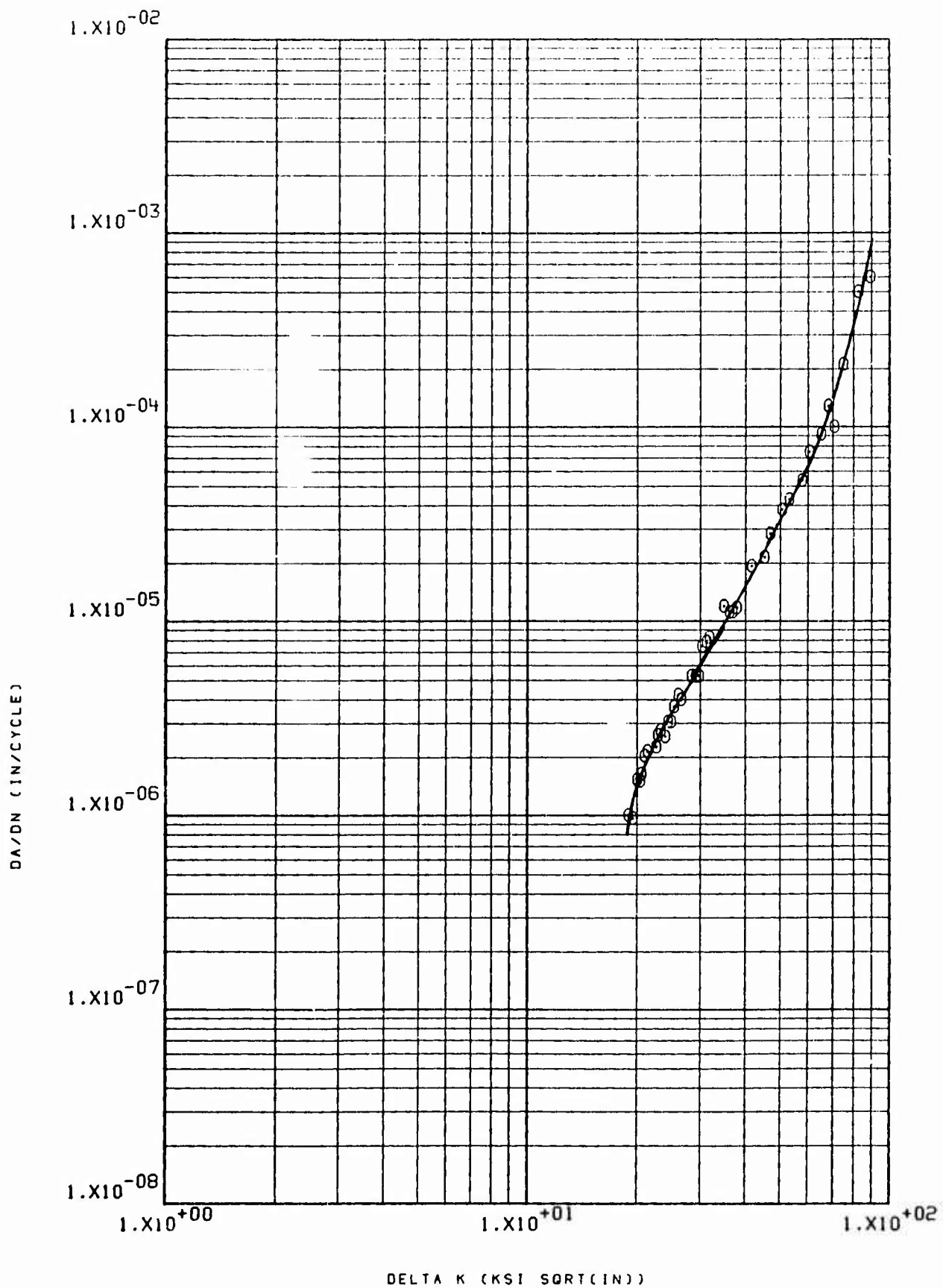


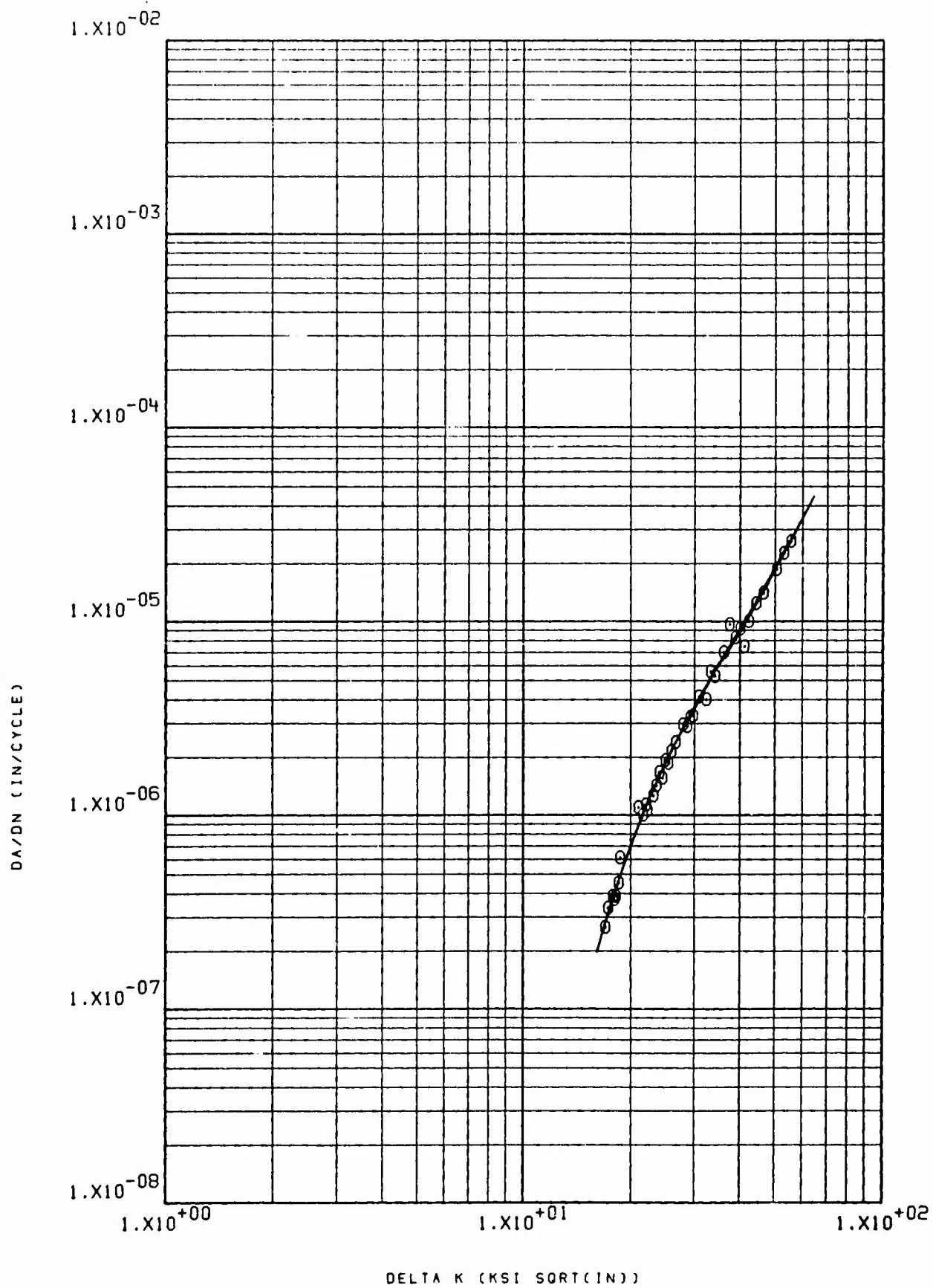




SI NRW 82-57 INCO 718 HT LHA RT R= .5 360CFM







APPENDIX D
FATIGUE CRACK GROWTH RATE
CURVES FOR ALL
TESTS OF WELDMENTS

APPENDIX D: INDEX OF FIGURES

Alloy and Condition	Figure No. (Specimen No.)	Crack Orientation and Location	"W" Nominal, Inches	"t", Inches	Environment	Test Temp	"R" (cpm)	Freq. (cpm)	Remarks	Page No
HP9-4-.20 Preweld Condition: Heat Treated to 190-210 ksi UTS.										1 to 10
Postweld:										
950F, 2 hrs.	33 NRT A503	RT-HAZ	4.0	.50	LHA	RT	.08	60		D-1
" "	33 NRT A521	" "	"	"	"	-65	"	"		D-2
" "	33 NRT A522	" "	"	"	Dist. Water	RT	"	"		D-3
950F, 2 hrs.	37 NRT A301	RT-Weld	"	"	"	"	"	"	Weld Overlay	D-4
None	37 NRT A304	" "	"	"	"	"	"	"	"	D-5
None	37 NRT A305	" "	"	"	"	"	"	"	"	D-6
950F, 2 hrs	37 NRT A308	" "	"	"	"	"	"	"	Grindout Reweld	D-7
None	37 NRT A309	" "	"	"	"	"	"	"	"	D-8
None	37 NRT A311	RT-HAZ	"	"	"	"	"	"		D-9
950F, 2 hrs	37 NRT A313	" "	"	"	"	"	"	"	Single U edge Preparation	D-10
PH13-8Mo Preweld Condition: H 1000										11 to 15
Postweld:										
None	40 NRT C301	RT-Weld	4.0	.25	STW	RT	.08	60	Grindout Reweld	D-11
950F, 2 hrs	40 NRT C305	RT-Weld	"	"	"	"	"	"	"	D-12
950F, 2 hrs	40 NRT C505	RT-HAZ	"	"	LHA	"	"	"		D-13
" "	40 NRT C506	" "	"	"	STW	"	"	"		D-14
" "	40 NRT C507	" "	"	"	STW	"	"	60		D-15

NOTE: All Figures Are For PTC Specimens, GTA Double U Type Butt Weld Joints, Unless Noted Differently In The Remarks Column.

APPENDIX D: INDEX OF FIGURES

Alloy and Condition	Figure No. (Specimen No.)	Crack Orientation and Location	"W" Nominal, Inches	"t" Inches	Environment	Test Temp	"R" (cpm)	Remarks	Page No
PH13-8Nb Preweld: Condition A.									
Postweld:									
1000F, 4 hrs	41 NRT C500	RT-HAZ	4.0	.25	Lab Air	-65	.08	360	16 to 22
"	41 NRT C501	"	"	"	LHA	RT	"	"	D-16
"	41 NRT C502	"	"	"	LHA	"	"	"	D-17
"	41 NRW C550	RW-Weld	6.0	"	Lab Air	-65	"	"	D-18
"	41 NRW C551	"	"	"	LHA	RT	.3	"	D-19
"	41 NRW C552	"	"	"	LHA	"	.08	"	D-20
"	41 NRW C554	"	"	"	STW	"	"	"	D-21
HP 9-4-.20 Preweld Condition: Heat Treated to 190-210 ksi UTS									
Postweld:									
950F, 2 hrs	57 NRT A500	RT-HAZ	4.0	.50	LHA	RT	.08	60	23 to 40
"	57 NRT A501	"	"	"	"	-65	"	360	D-23
"	57 NRT A502	"	"	"	STW	RT	"	60	D-24
"	57 NRT A506	"	"	"	Dist. Water	"	.5	"	D-25
"	57 NRT A508	-BM	"	"	LHA	"	.08	"	D-26
"	57 NRT A509	-HAZ	"	"	"	-65	"	360	D-27
"	57 NRT A510	"	"	"	"	RT	.08	60	D-28
"	57 NRT A514	-Weld	"	"	"	-65	"	"	D-29
"	57 NRT A517	-HAZ	"	"	"	RT	.08	"	D-30
"	57 NRT A518	"	"	.75	Dist. Water	"	"	"	D-31
"	57 NRT A519	"	"	.25	LHA	"	"	"	D-32
"	57 NRW A550	RW-Weld	6.0	.50	Dist. Water	"	"	"	D-33
"	57 NRW A551	"	"	"	LHA	"	.5	360	D-34
"	57 NRW A552	"	"	"	"	"	.3	"	D-35
"	57 NRW A553	"	"	"	"	"	.08	"	D-36
"	57 NRW A554	"	"	"	100% Hum	"	"	60	D-37
"	57 NRW A555	"	"	"	LHA	"	"	360	D-38
"	57 NRW A556	"	"	"	"	"	"	60	D-39
"	57 NRW A556	"	"	"	100% Hum	"	"	"	D-40

NOTE: All Figures Are For PTC Specimens, GTA Double U Type Butt Weld Joints, Unless Noted Differently In The Remarks Column.

APPENDIX D: INDEX OF FIGURES

Alloy and Condition	Figure No. (Specimen No.)	Crack Orientation and Location	"W" Nominal, Inches	"t" Inches	Environment	Test Temp	"R"	Freq. (cpm)	Remarks	Page No
Ti-6Al-4V Preweld - MA Postweld-1100F, 2 hrs	62 NRW 121-18-1	RW-Weld	6.0	.50	LHA	RT	.08	60	CT Type, H/W = 0.6	D-41
	62 NRW 121-18-2	" "	"	"	"	"	"	360		D-42
	62 NRW 121-19-1	" "	"	"	STW	"	"	60		D-43
Ti-6Al-4V Preweld - RA Postweld-1100F, 2 hrs	70 NRT B509	RT-Weld	4.0	.50	LHA	RT	.08	360		D-44
Ti-6Al-4V Preweld - MA (β extruded) Postweld-1100F, 2 hrs	75 NRT B515	RT-HAZ	4.0	.50	LHA	RT	.08	360		D-45
	75 NRT B516	" "	"	"	"	-65	"	"		D-46
	75 NRT B517	" "	"	"	STW	RT	"	60		D-47
	75 NRT B533	" -Weld	"	"	LHA	"	"	360		D-48
Ti-6Al-4V Preweld - RA Postweld-1200F, 1 hr	76 NRT B518	RT-HAZ	4.0	.75	LHA	RT	.08	60		D-49
	76 NRT B519	" "	"	"	STW	"	"	"		D-50
Ti-6Al-4V Preweld - MA Postweld-1100F, 2 hrs	80 NRW B522	RW-HAZ	24.0	.10	LHA	RT	.08	60	CCT Type, Square Edge Preparation	D-51
	80 NRW B523	" "	"	"	STW	"	"	"		D-52

NOTE: All Figures Are For PTC Specimens, GTA Double U Type Butt Weld Joints,
Unless Noted Differently In The Remarks Column,

APPENDIX D: INDEX OF FIGURES

Alloy and Condition	Figure No. (Specimen No.)	Crack Orientation and Location	"w" Nominal, Inches	"t" Inches	Environment	Test Temp	"R" Freq. (cpm)	Remarks	Page No
Ti-6Al-4V Preweld-RA Postweld-1100F, 2 hrs	87 NRT B500	RT-HAZ	4.0	.50	LHA	RT	.08	360	D-53
Ti-6Al-4V Preweld: RA Postweld: 1100F, 2 hrs " " None 1100F, 2 hrs	88 NRT B300 88 NRT B303 88 NRT B304 88 NRT B514	RT-Weld " " " " " -HAZ	4.0 " " " " " "	.50 " " " " " "	LHA STW " " " "	RT " " " " " "	.08 " " " " " "	Weld Overlay Grindout Reweld " " Single U Edge Preparation	D-54 D-55 D-56 D-57
" "	88 NRT B503	" "	" "	" "	LHA	" "	.3	360	D-58
" "	88 NRT B504	" "	" "	" "	STW	" "	.08	60	D-59
" "	88 NRT B505	" "	" "	" "	LHA	-65	" "	360	D-60
" "	88 NRT B506	" "	" "	" "	STW	RT	" "	60	D-61
" "	88 NRT B507	" "	" "	" "	" "	" "	.3	" "	D-62
" "	88 NRT B508	" "	" "	" "	SCS	" "	.08	" "	D-63
" "	88 NRT B510	RT-Weld	" "	" "	STW	" "	" "	360	D-64
" "	88 NRT B520	RT-HAZ	" "	.25	LHA	" "	" "	60	D-65
" "	88 NRT B524	" "	" "	.50	" "	" "	" "	360	D-66
" "	88 NRT B525	" "	" "	" "	" "	" "	" "	60	D-67
" "	88 NRT B526	" "	" "	" "	Freon TF	" "	" "	" "	D-68
" "	88 NRT B527	" "	" "	" "	LHA	" "	" "	360	D-69
" "	88 NRT B528	" "	" "	" "	" "	" "	" "	" "	D-70
" "	88 NRT B530	RT-Weld	" "	" "	" "	" "	" "	" "	D-71
" "	88 NRT B531	RT-Haz	" "	" "	" "	" "	" "	" "	D-72
" "	88 NRT B532	" "	" "	" "	STW	" "	" "	" "	D-73

NOTE: All Figures Are For PTC Specimens, GTA Double U Type Butt Weld Joints,
Unless Noted Differently In The Remarks Column.

APPENDIX D: INDEX OF FIGURES

Alloy and Condition	Figure No. (Specimen No.)	Crack Orientation and Location	"W" Nominal, Inches	"t" Inches	Environment	Test Temp	"R" Freq. (cpm)	Remarks	Page No
Ti-6Al-4V Preweld: RA Postweld: (Cont'd) 1200F, 1 hr " " " " " " " " " 1400F, 1 hr " " " 1100F, 2 hrs " " "	88 NRT B535	RT-HAZ	4.0	.50	LHA	RT	.08		D-74
	88 NRT B536	RT-Weld	"	"	STW	"	360		D-75
	88 NRT B537	RT-HAZ	"	"	"	"	"		D-76
	88 NRT B538	" "	"	"	LHA	"	360		D-77
	88 NRT B539	" "	"	"	STW	"	60		D-78
	88 NRT B540	" "	"	"	LHA	"	360		D-79
	88 NRW B550	RW-Weld	6.0	"	STW	"	60	CT Type, H/W = 0.6	D-80
	88 NRW B551	" "	"	"	LHA	-65	360		D-81
	89 NRT B502	RT-HAZ	4.0	.50	LHA	RT	.08		D-82

NOTE: All Figures Are For PTC Specimens, GTA Double U Type Butt Weld Joints,
Unless Noted Differently In The Remarks Column

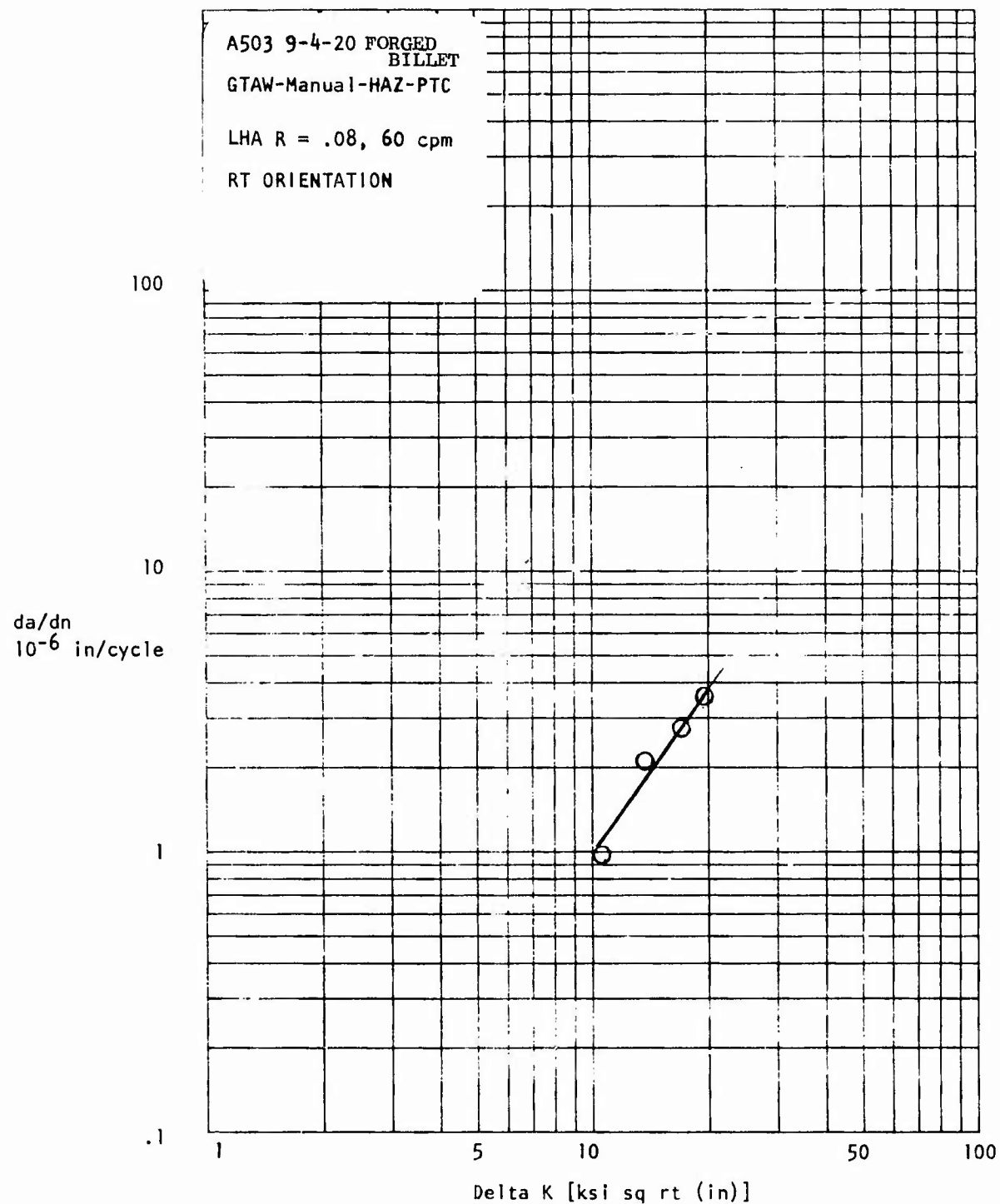


Figure 33 NRT A503 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in LHA

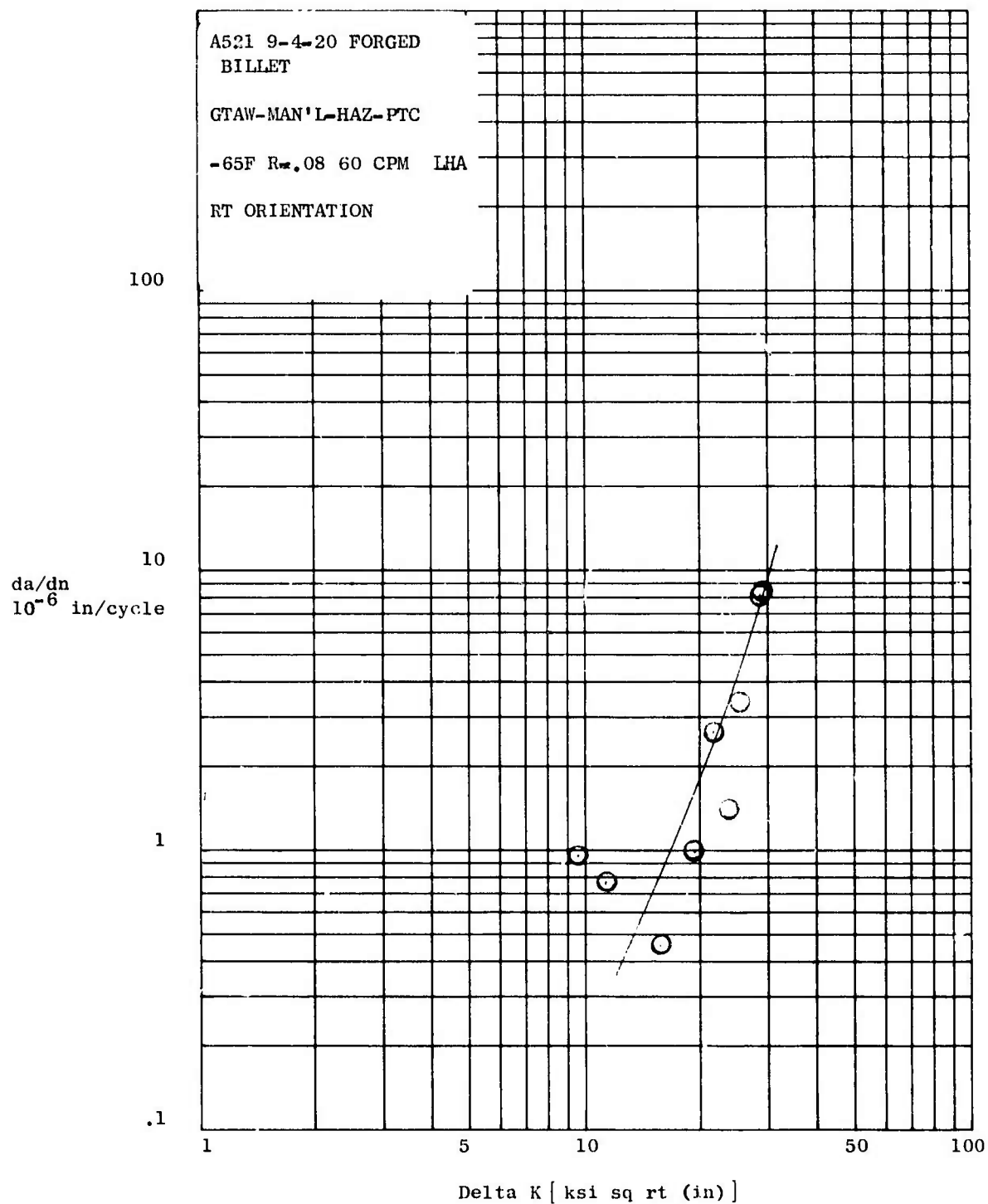


Figure 33 NRT A521 Fatigue Crack Growth Rate at -65F in the HAZ of a Welded 9-4-20 Forged Billet PTC Specimen.

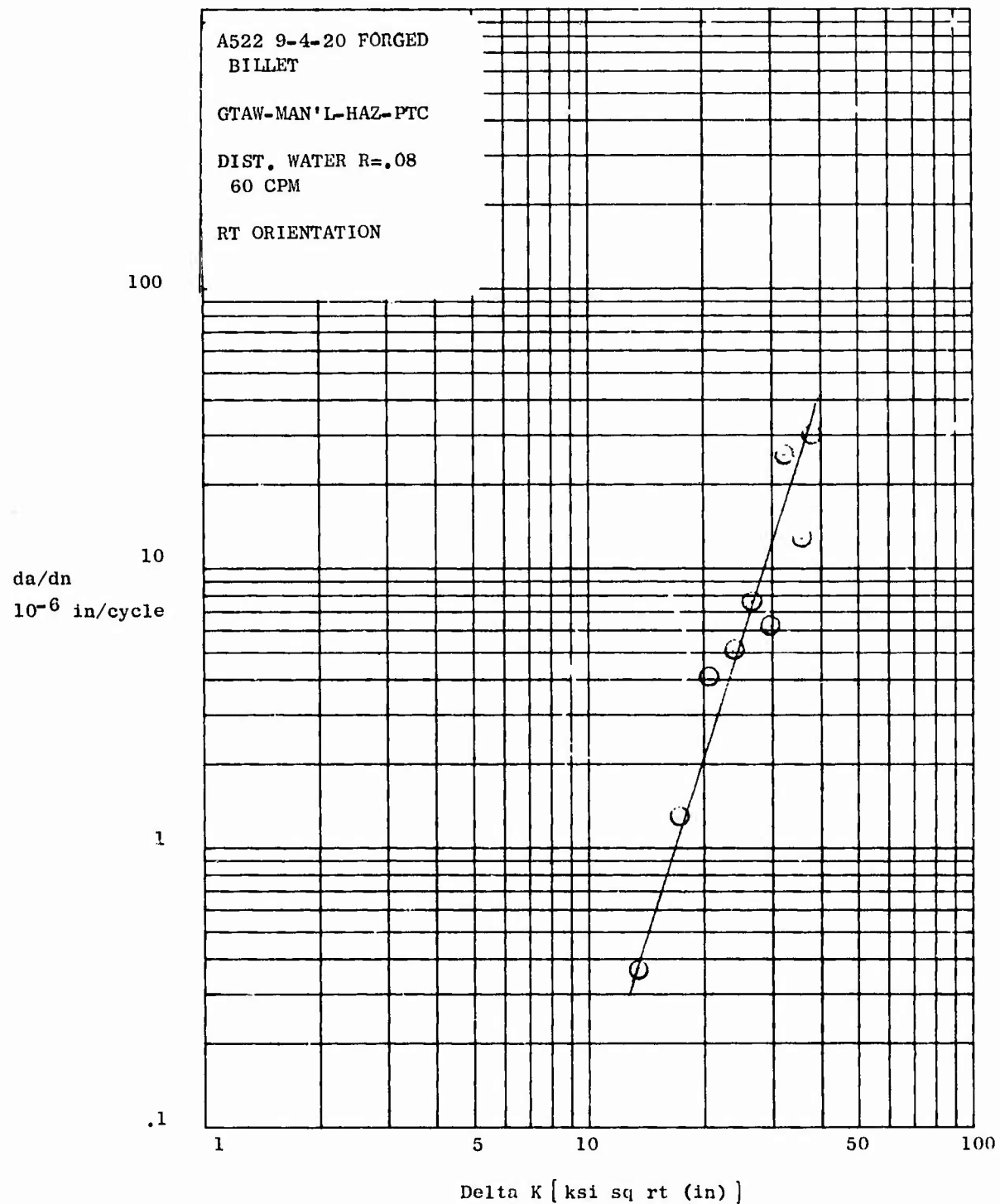


Figure 33 NRT A522 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Forged Billet PTC Specimen.

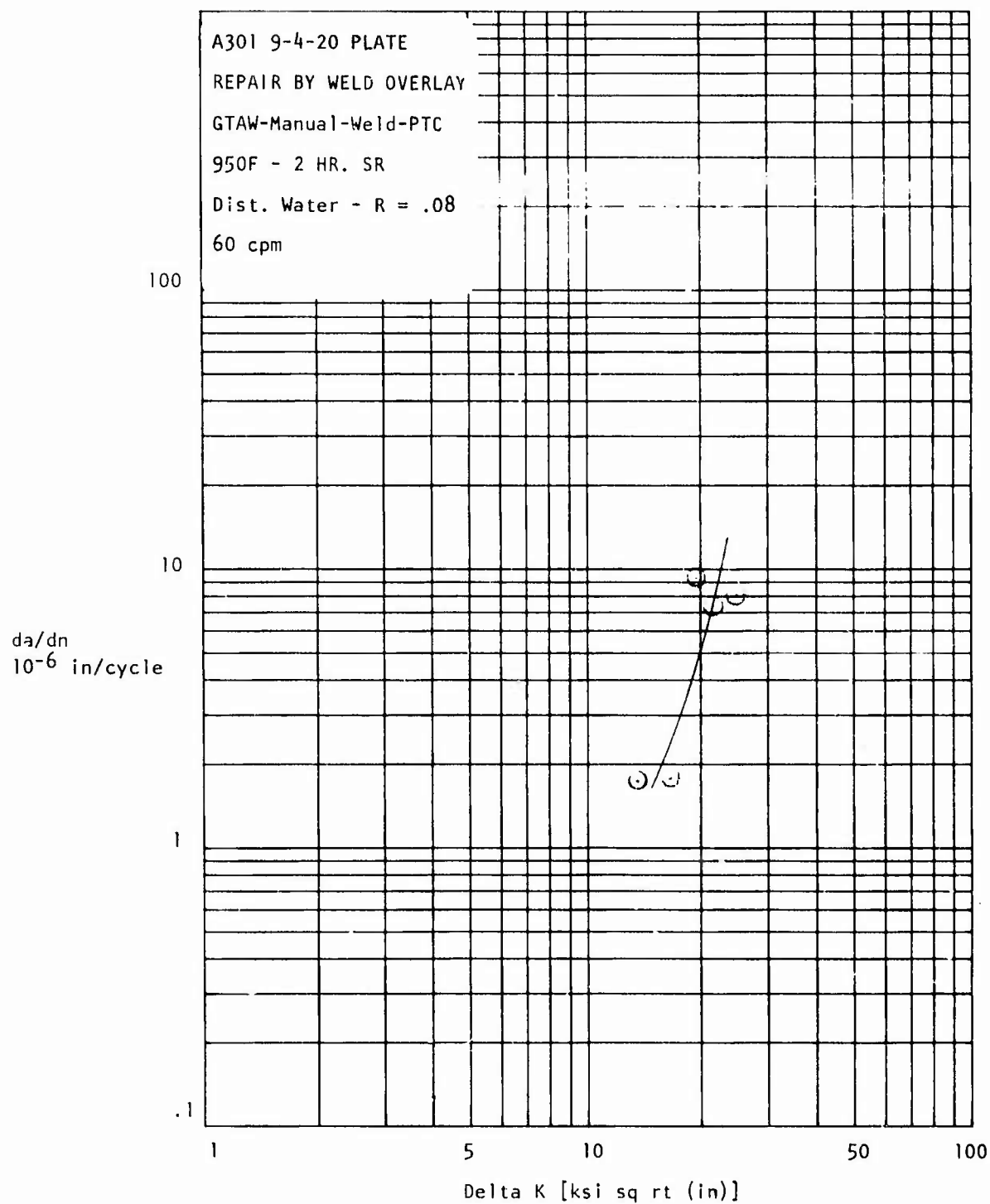


Figure 37 NRT A301 Fatigue Crack Growth Rate in the Overlay Repair Weld on a Stress Relieved 9-4-20 Plate PTC Specimen

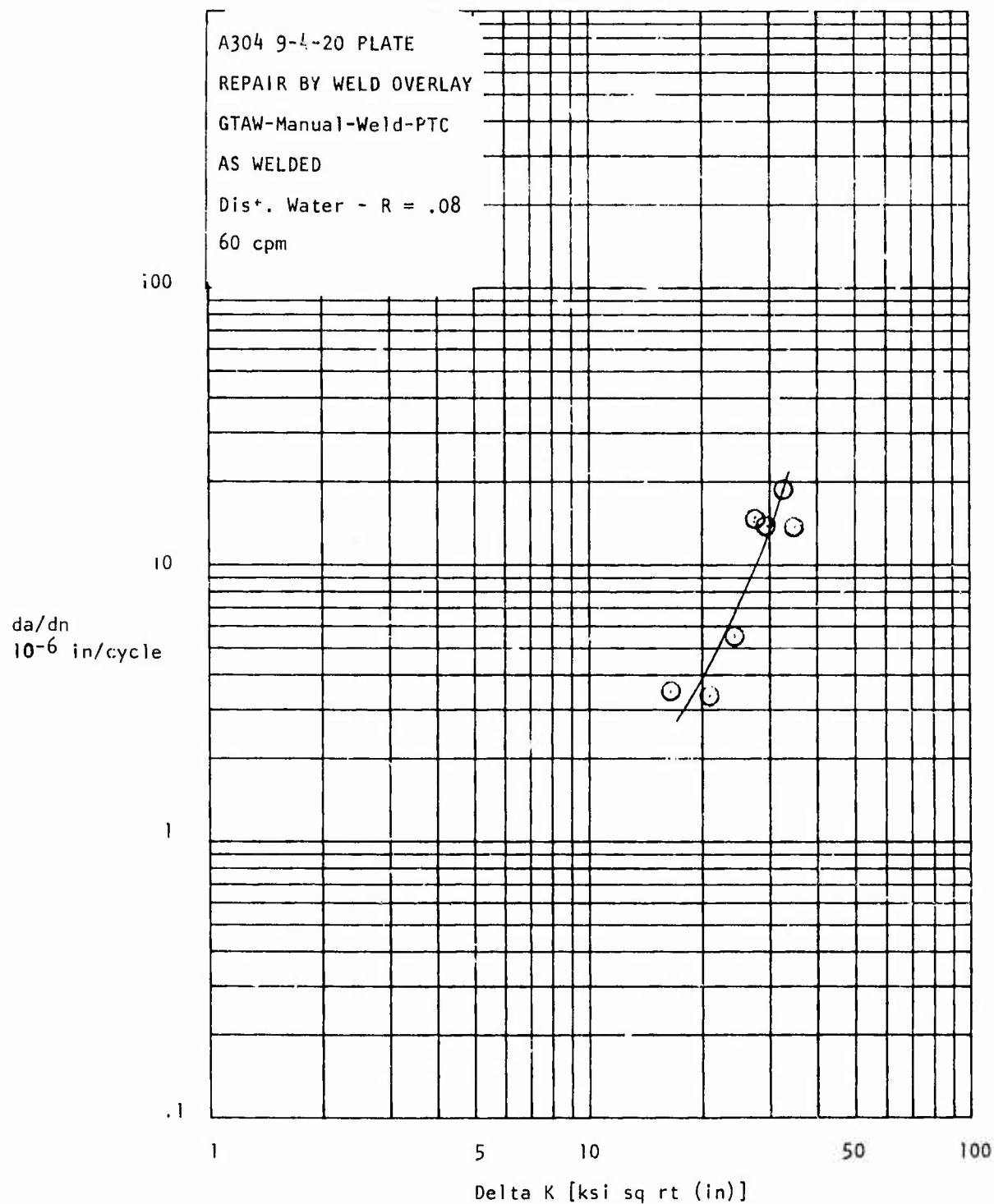


Figure 37 NRT A304 Fatigue Crack Growth Rate in the Overlay Repair Weld on an As-Welded 9-4-20 Plate PTC Specimen

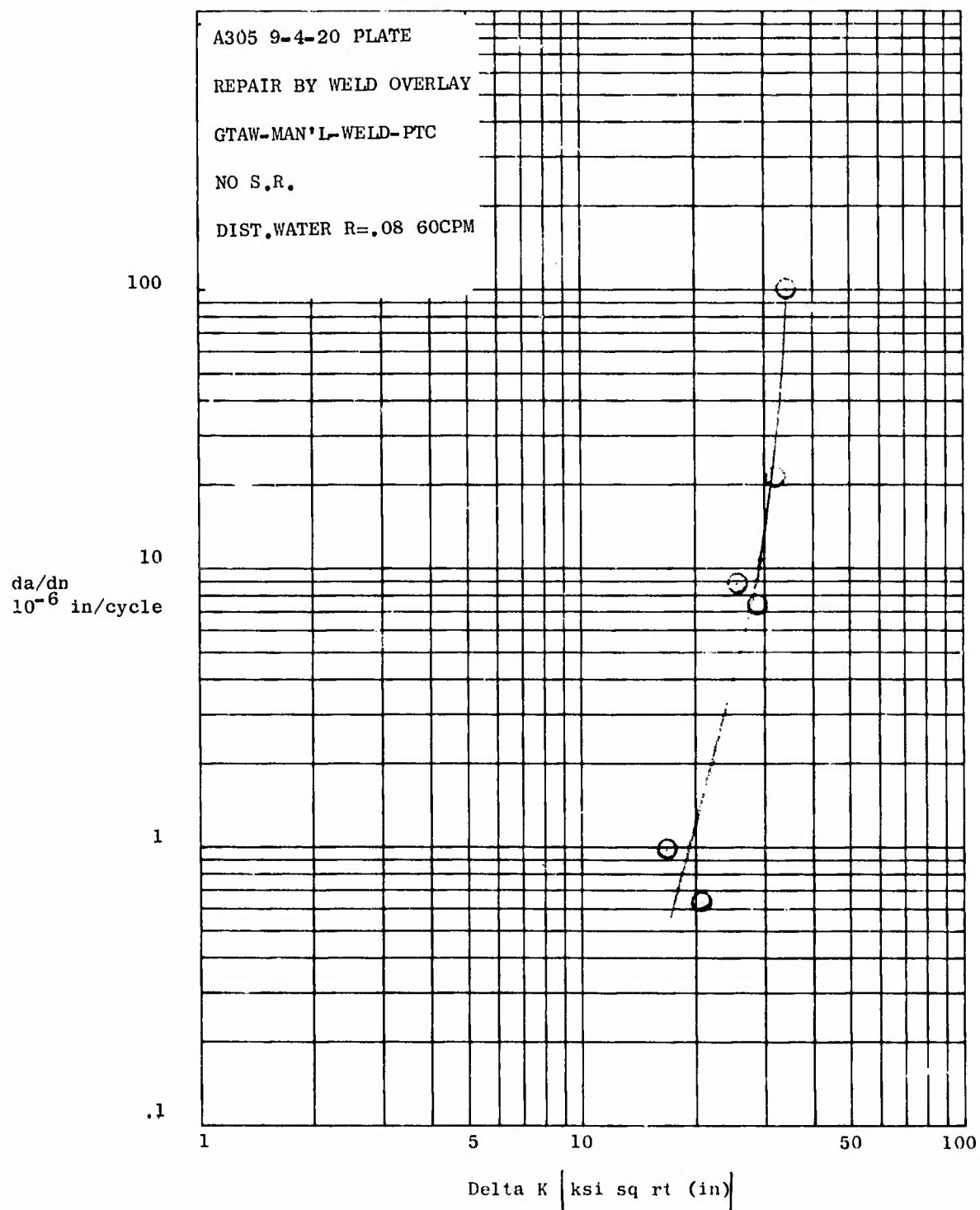


Figure 37 NRT A305 Fatigue Crack Growth Rate in the Overlay Repair Weld on a Non-Stress Relieved 9-4-20 Plate-PTC Specimen.

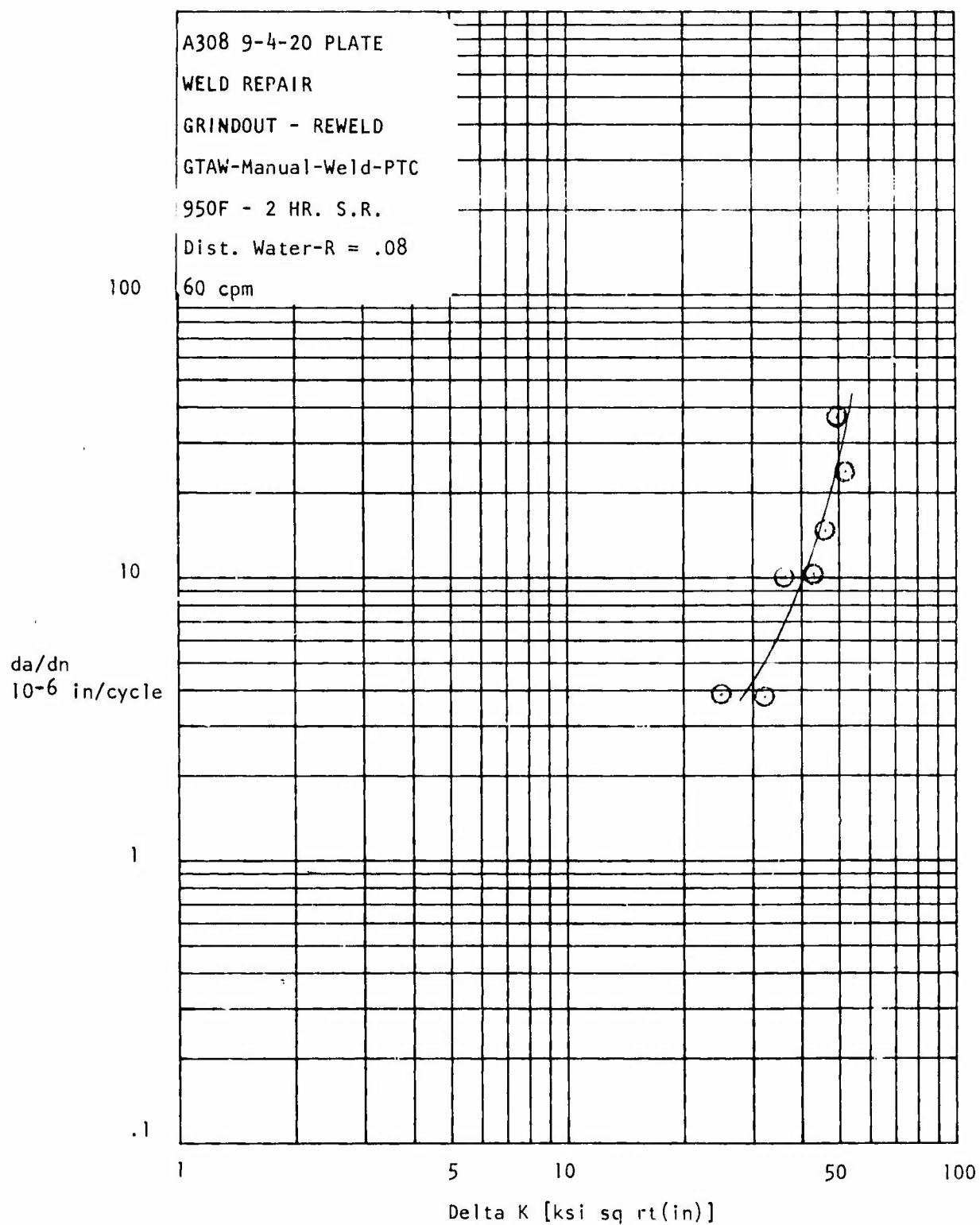


Figure 37 NRT A308

Fatigue Crack Growth Rate in the Weld of a Rewelded Stress Relieved 9-4-20 Plate PTC Specimen

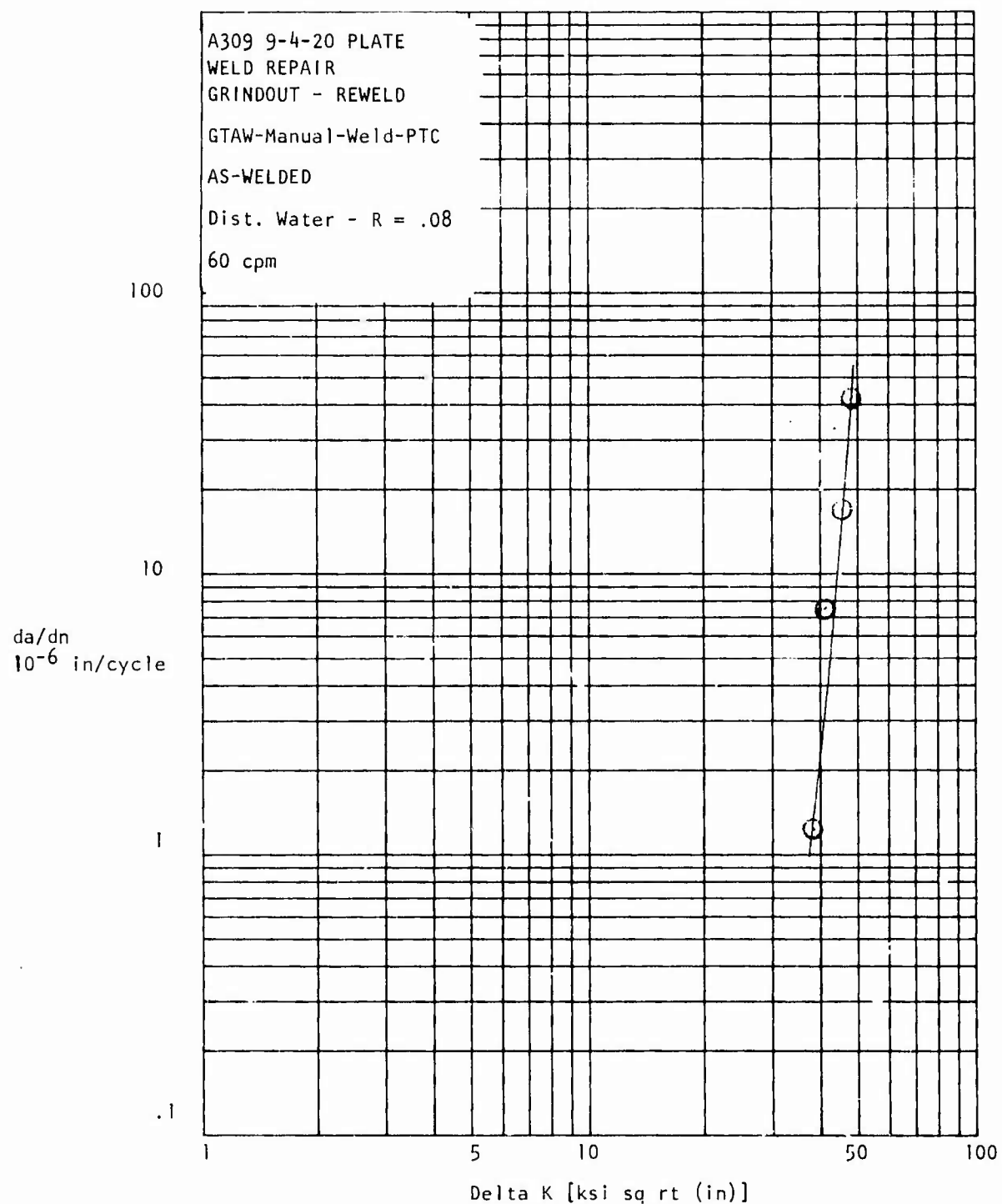


Figure 37 NRT A309 Fatigue Crack Growth Rate in the Weld of a Rewelded 9-4-20 Plate PTC Specimen with no Stress Relief

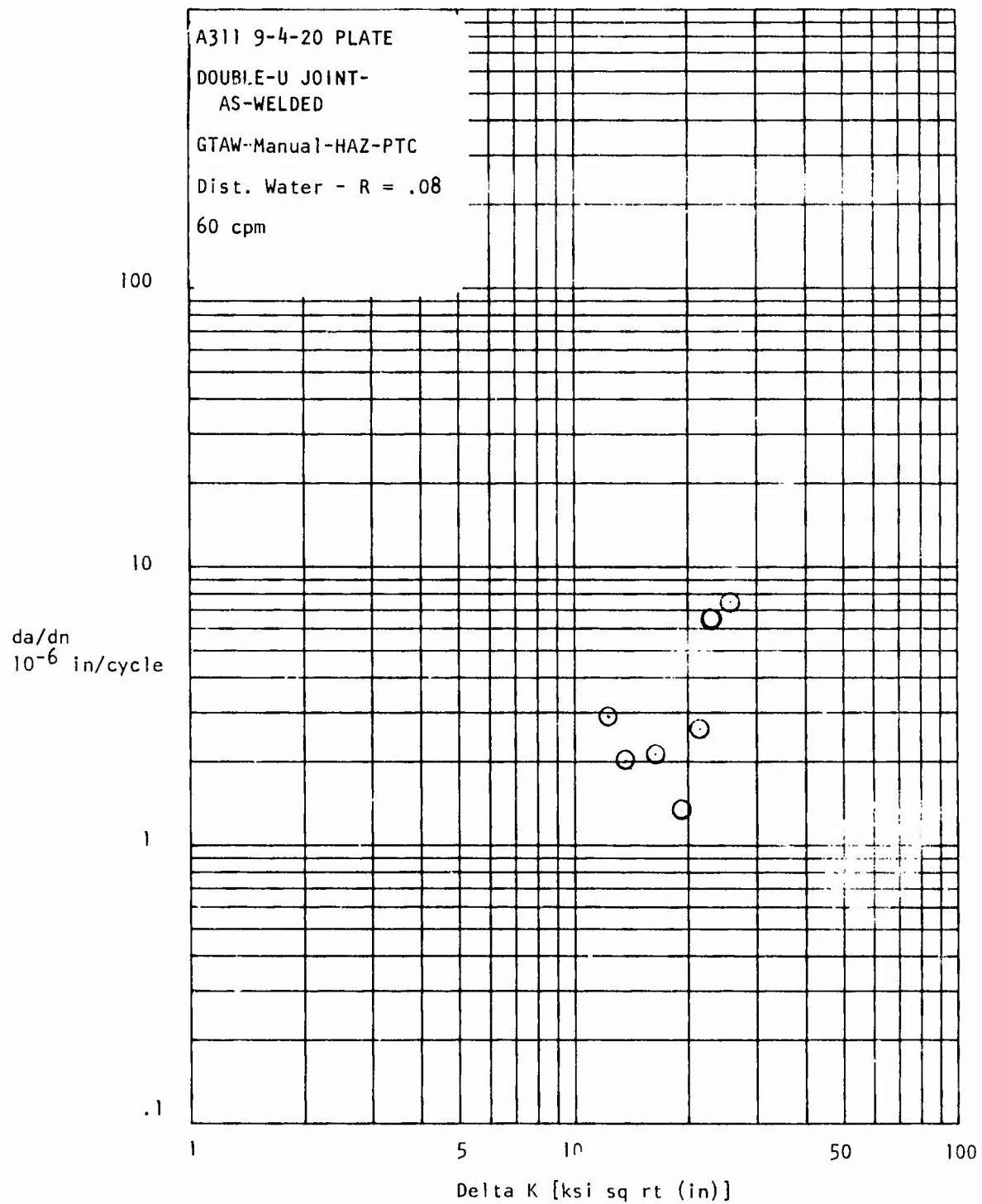


Figure 37 NRT A311

Fatigue Crack Growth Rate in the HAZ on an As-Welded
9-4-20 Plate PTC Specimen

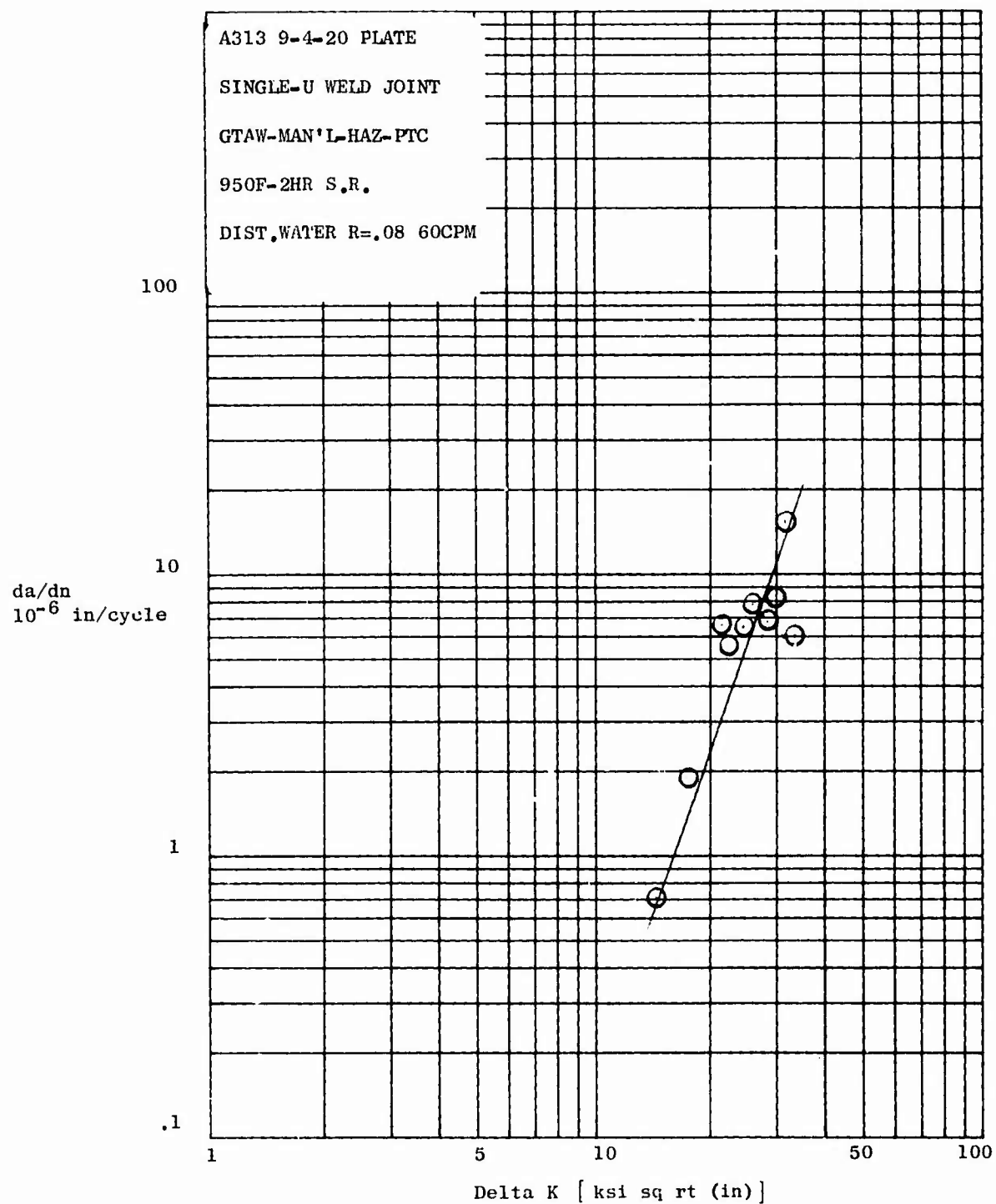


Figure 37 NRT A313 Fatigue Crack Growth Rate in the HAZ of a Single-U Weld Joint in 9-4-20 Plate PTC Specimen.

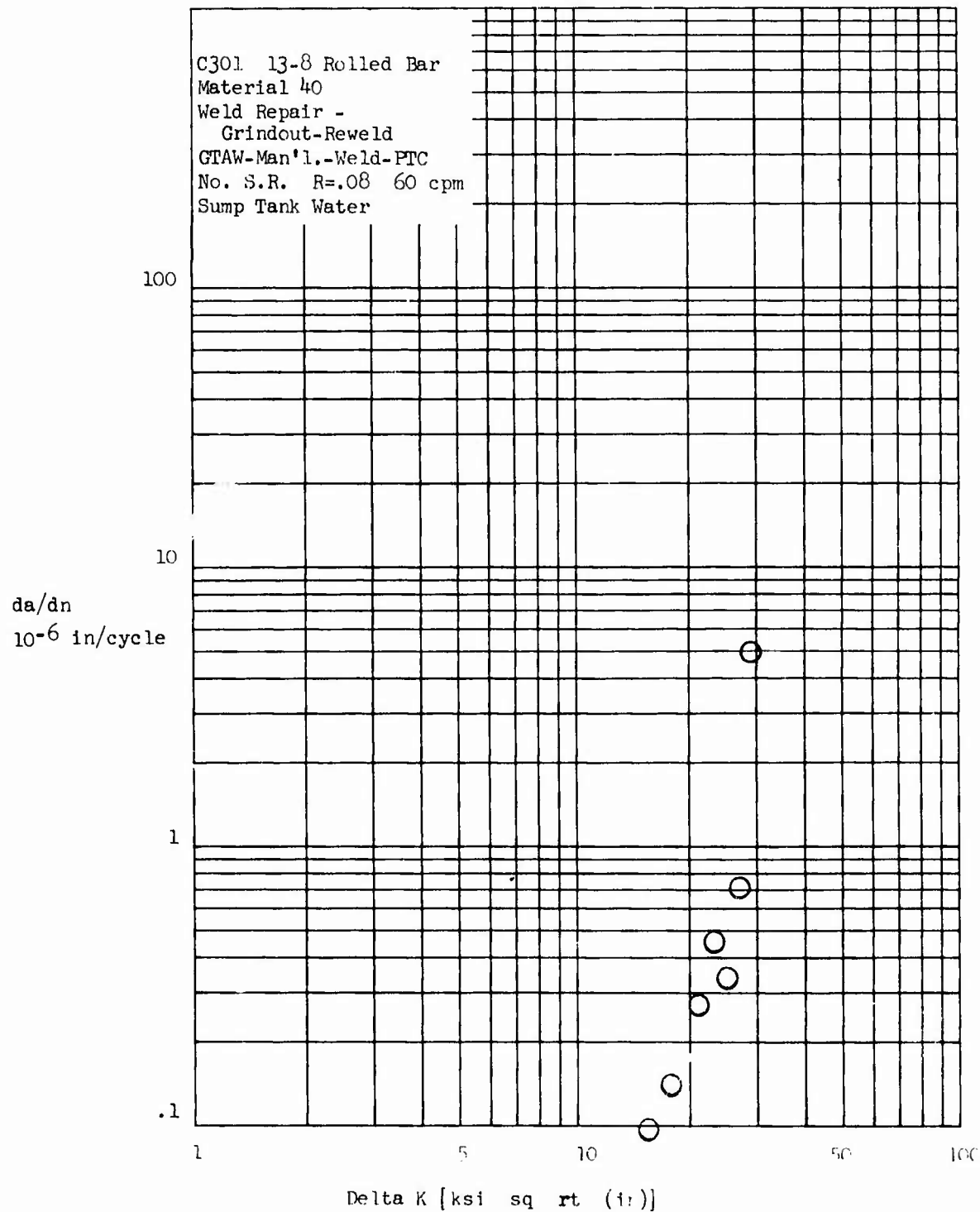


Figure 40 NRT C301 Fatigue Crack Growth Rate in the Weld of a Rewelded Non-Stress Relieved 13-8 Rolled Bar PTC Specimen.

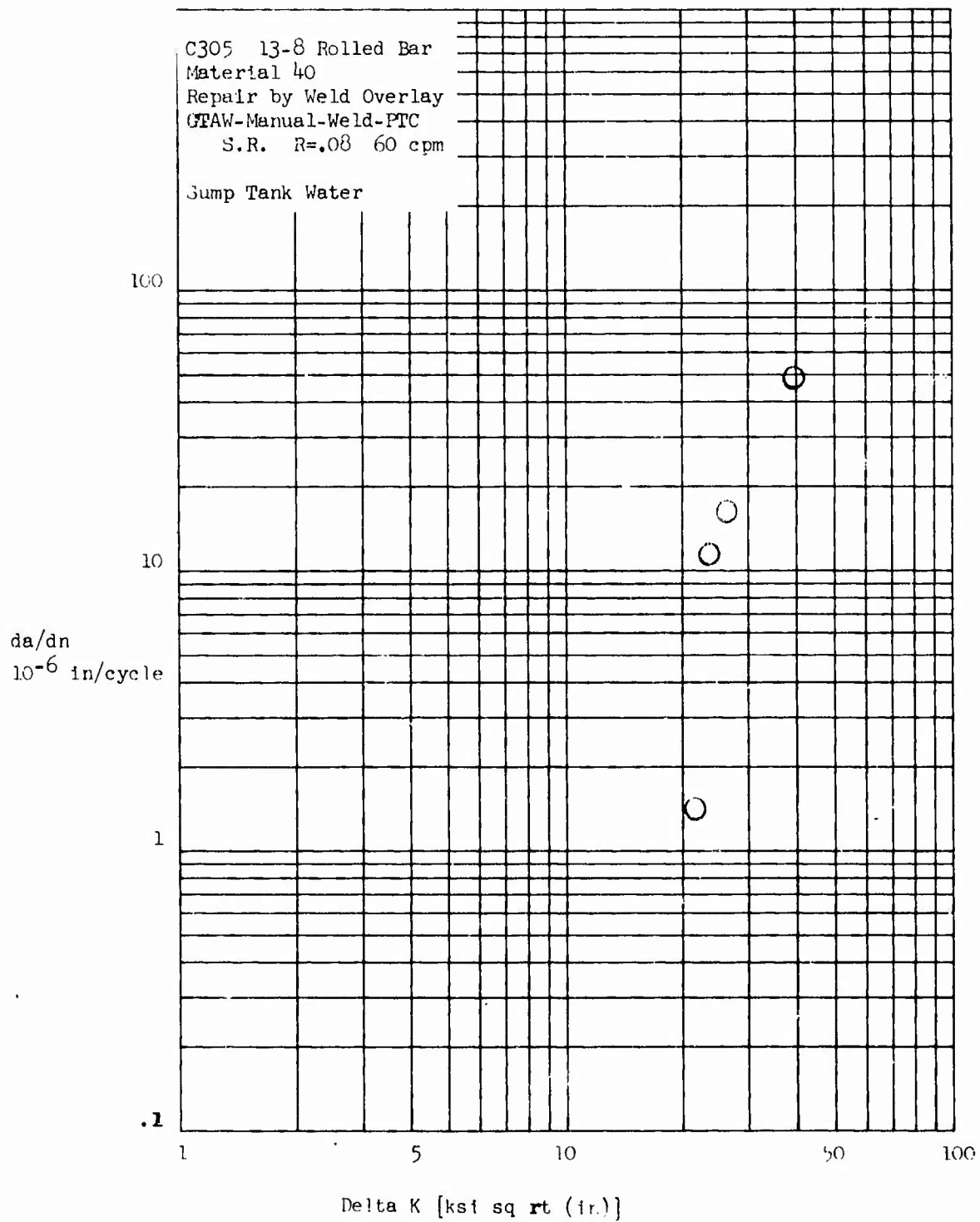


Figure 40 NRT C305 Fatigue Crack Growth Rate in the Overlay Repair Weld
 on a **Stress-Relieved** 13-8 Rolled Bar PTC Specimen

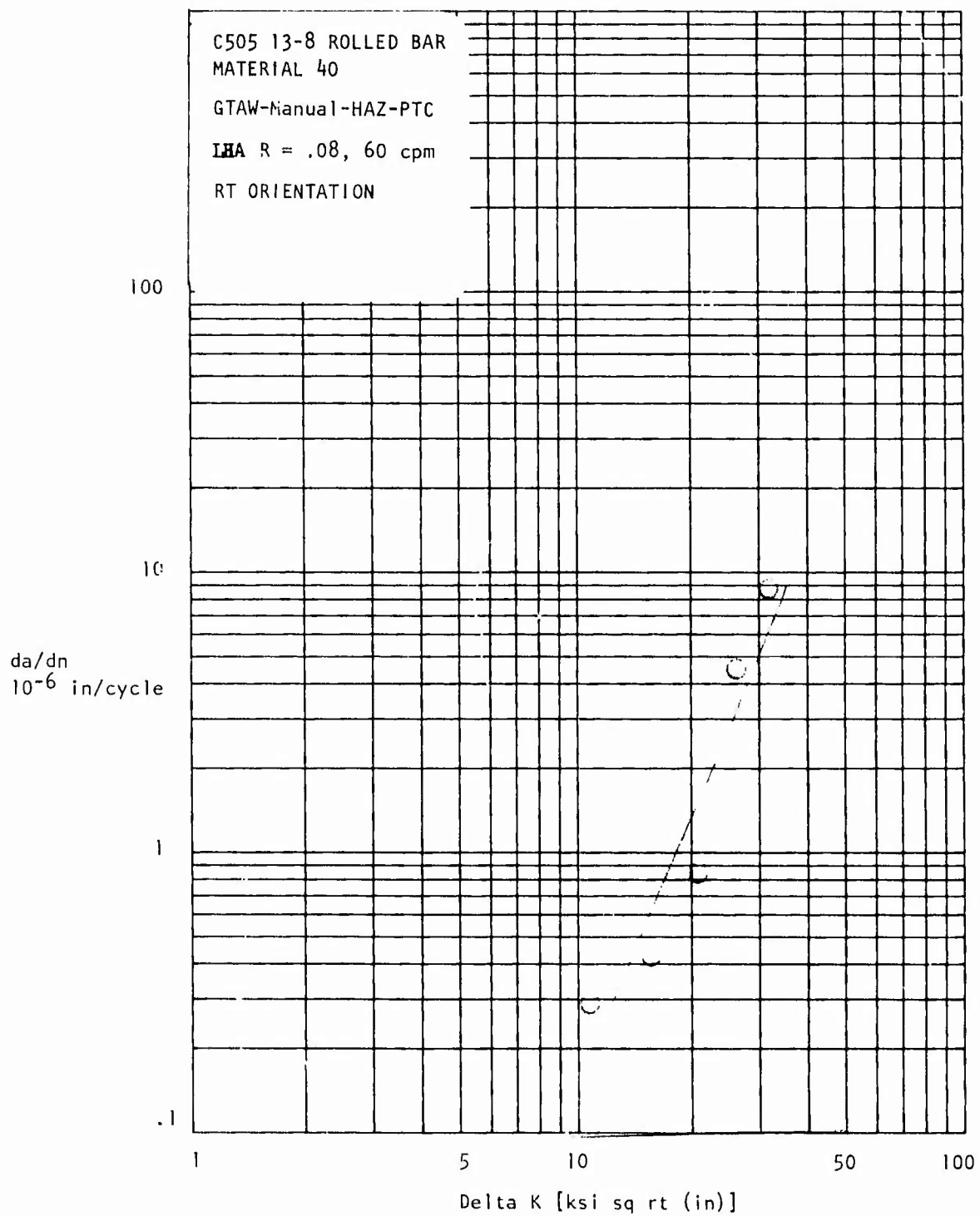


Figure 40 NRT C505 Fatigue Crack Growth Rate in the HAZ of a Welded 13-8
 Rolled Bar PTC Specimen in LHA

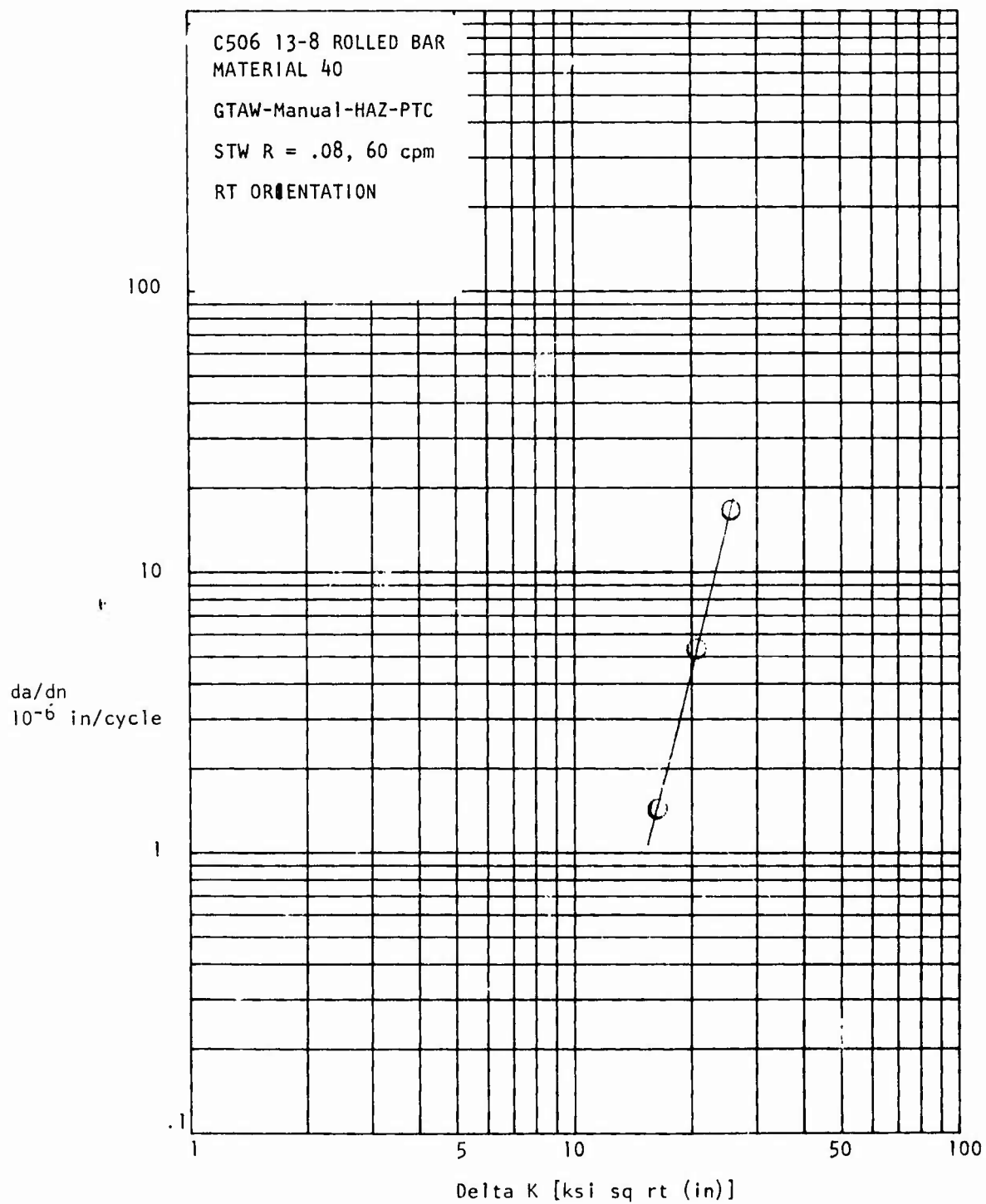


Figure 40 NRT C506 Fatigue Crack Growth Rate in the HAZ of a Welded 13-8 Rolled Bar PTC Specimen in STW

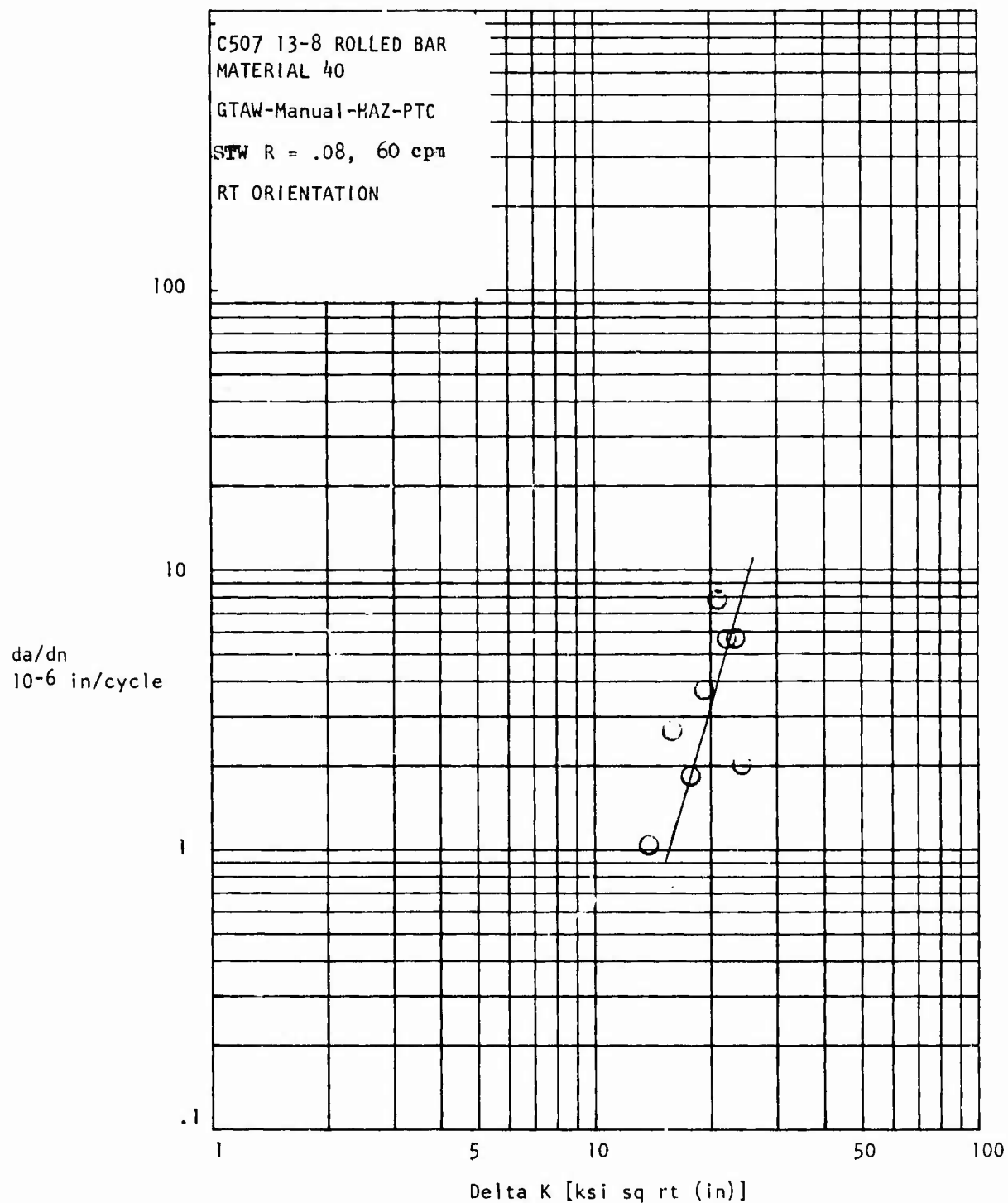


Figure 40 NRT C507

Fatigue Crack Growth Rate in the HAZ of a Welded 13-8
Rolled Bar PTC Specimen in STW

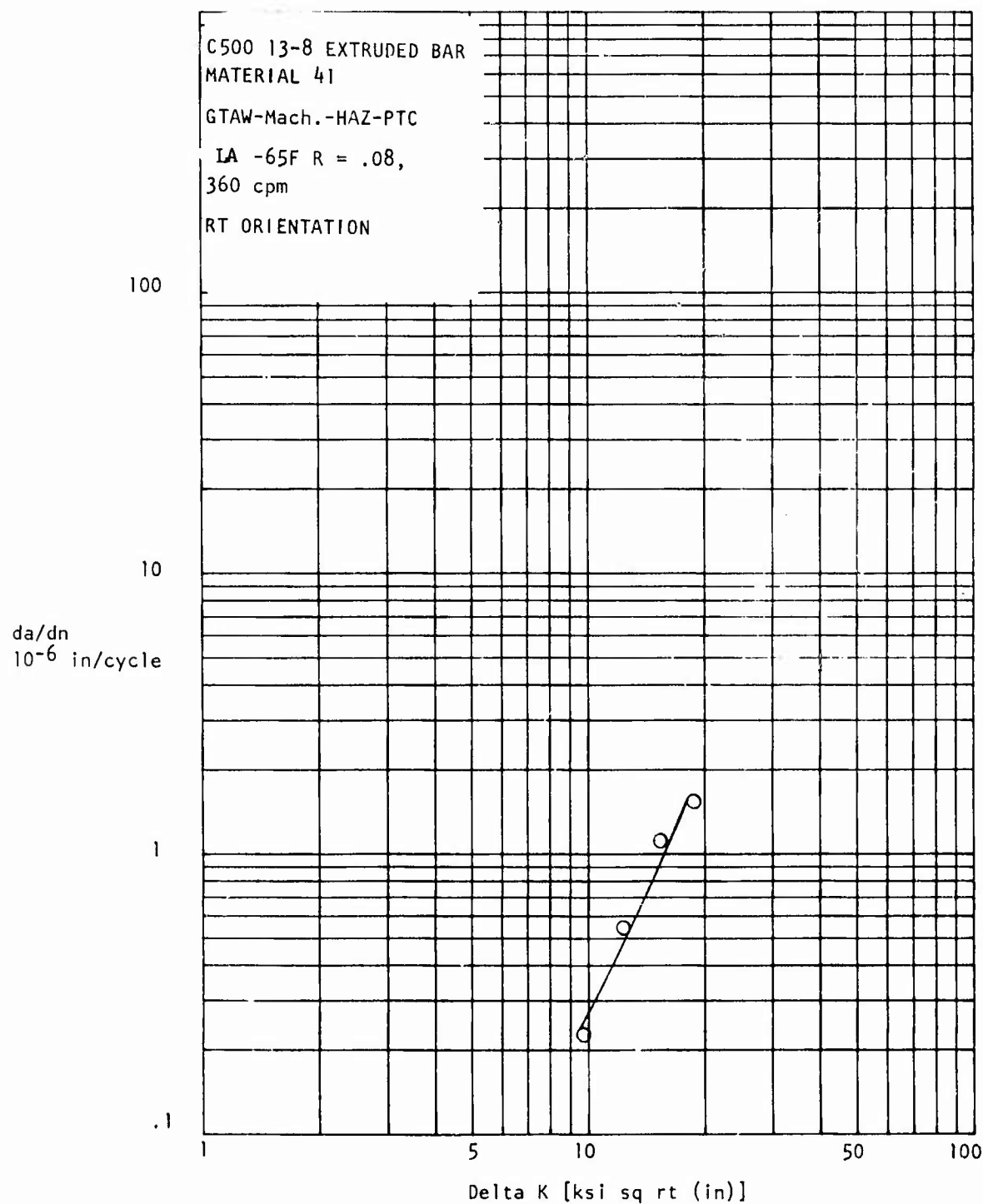


Figure 41 NRT C500 Fatigue Crack Growth Rate in the HAZ of a Welded 13-8 Extruded Bar PTC Specimen in IA at -65F

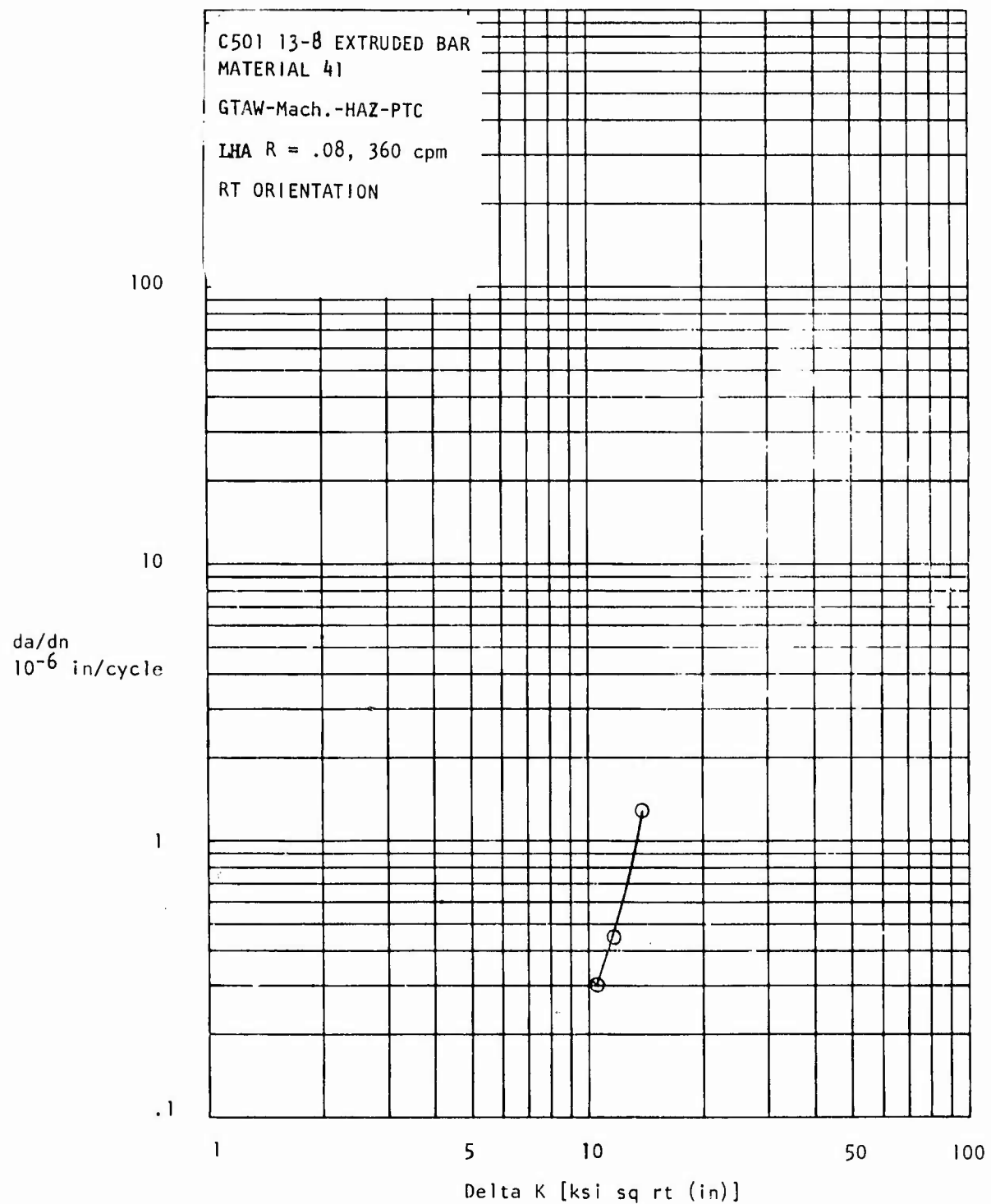


Figure 41 NRT C501 Fatigue Crack Growth Rate in the HAZ of a Welded 13-8 Extruded Bar PTC Specimen in LHA

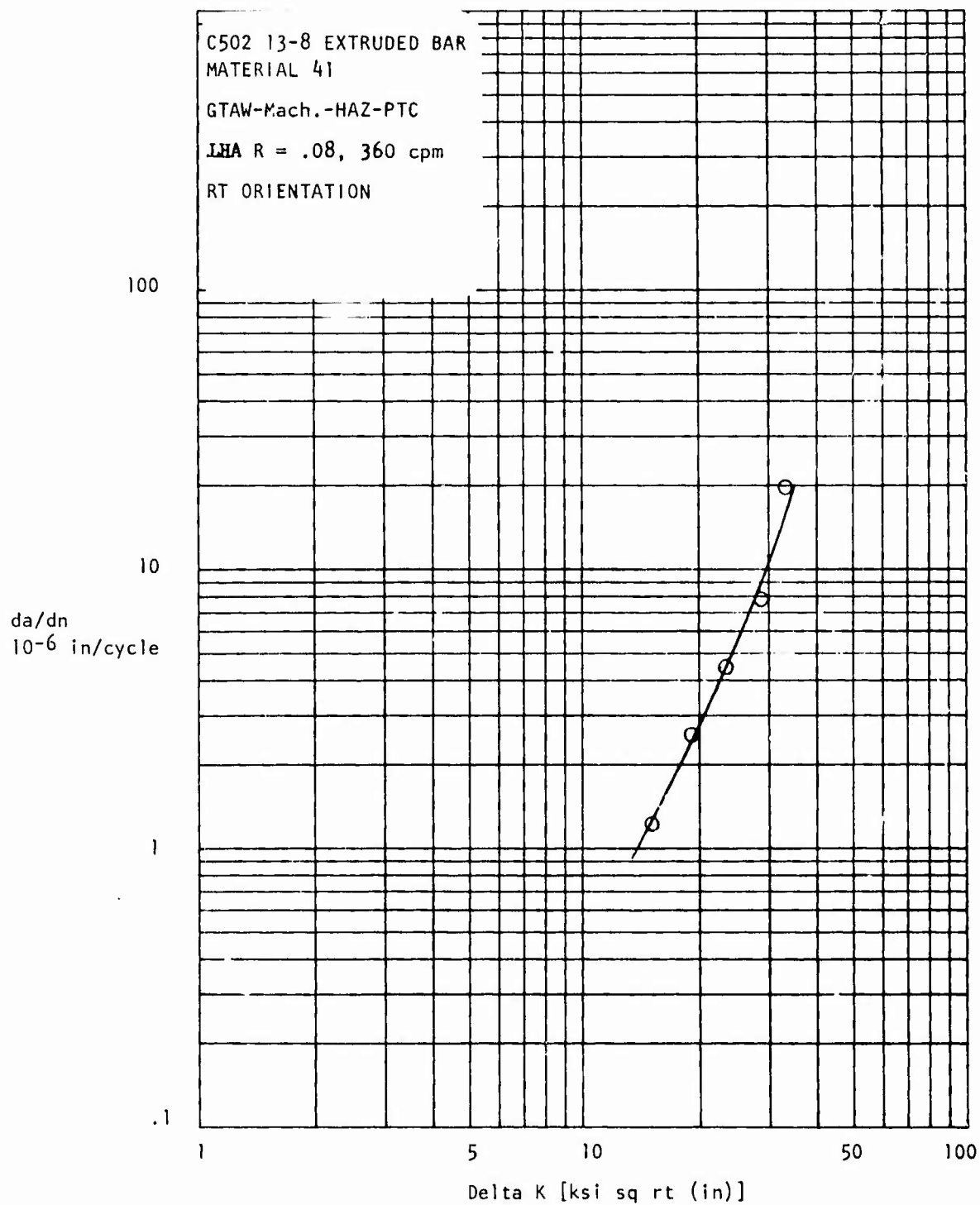


Figure 41 NRT C502 Fatigue Crack Growth Rate in the HAZ of a Welded 13-8 Extruded Bar PTC Specimen in LHA

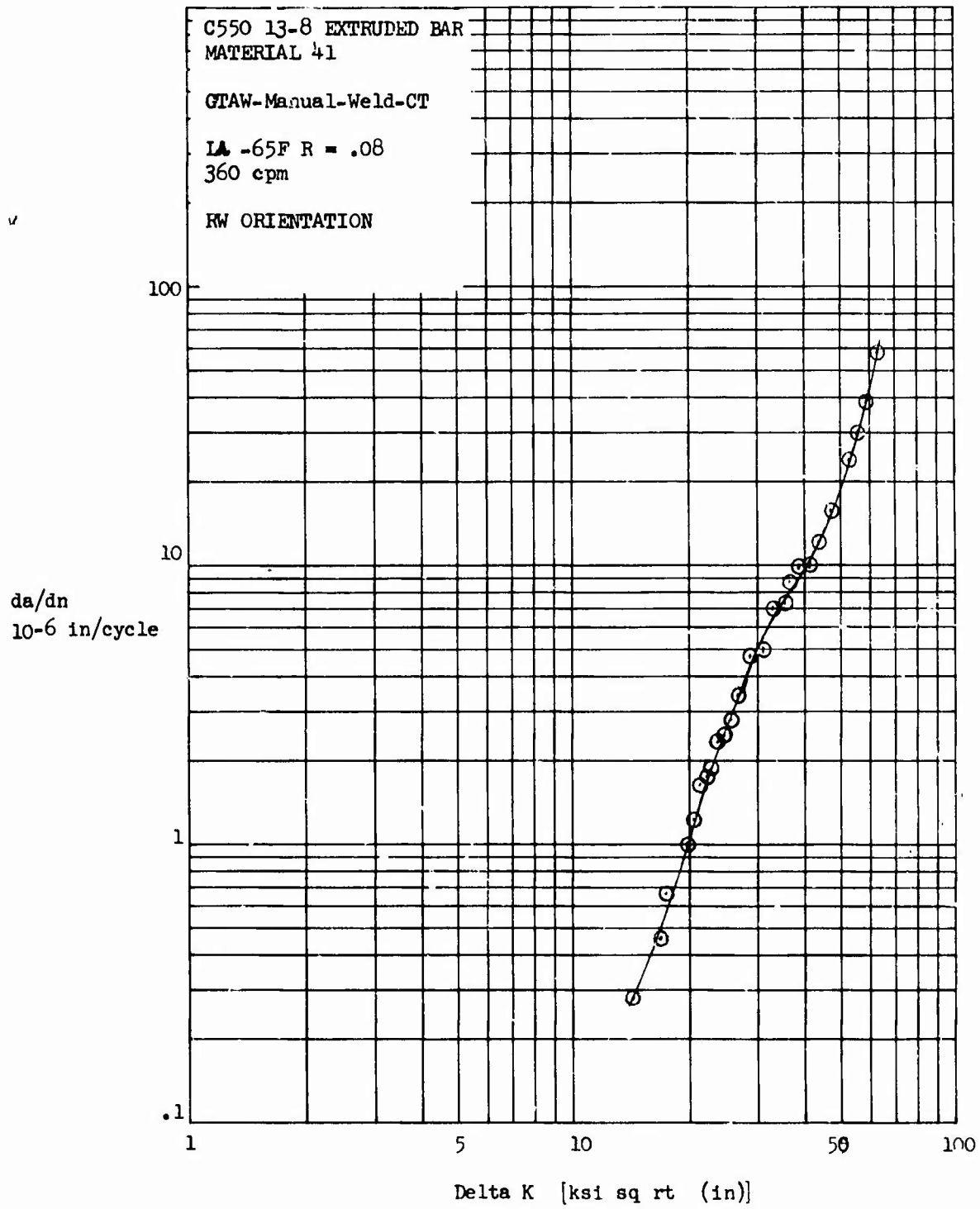


Figure 41 NRW C550

Fatigue Crack Growth Rate in the Weld Metal of
Welded 13-8 Extruded Bar CT Specimen in LA at -65F

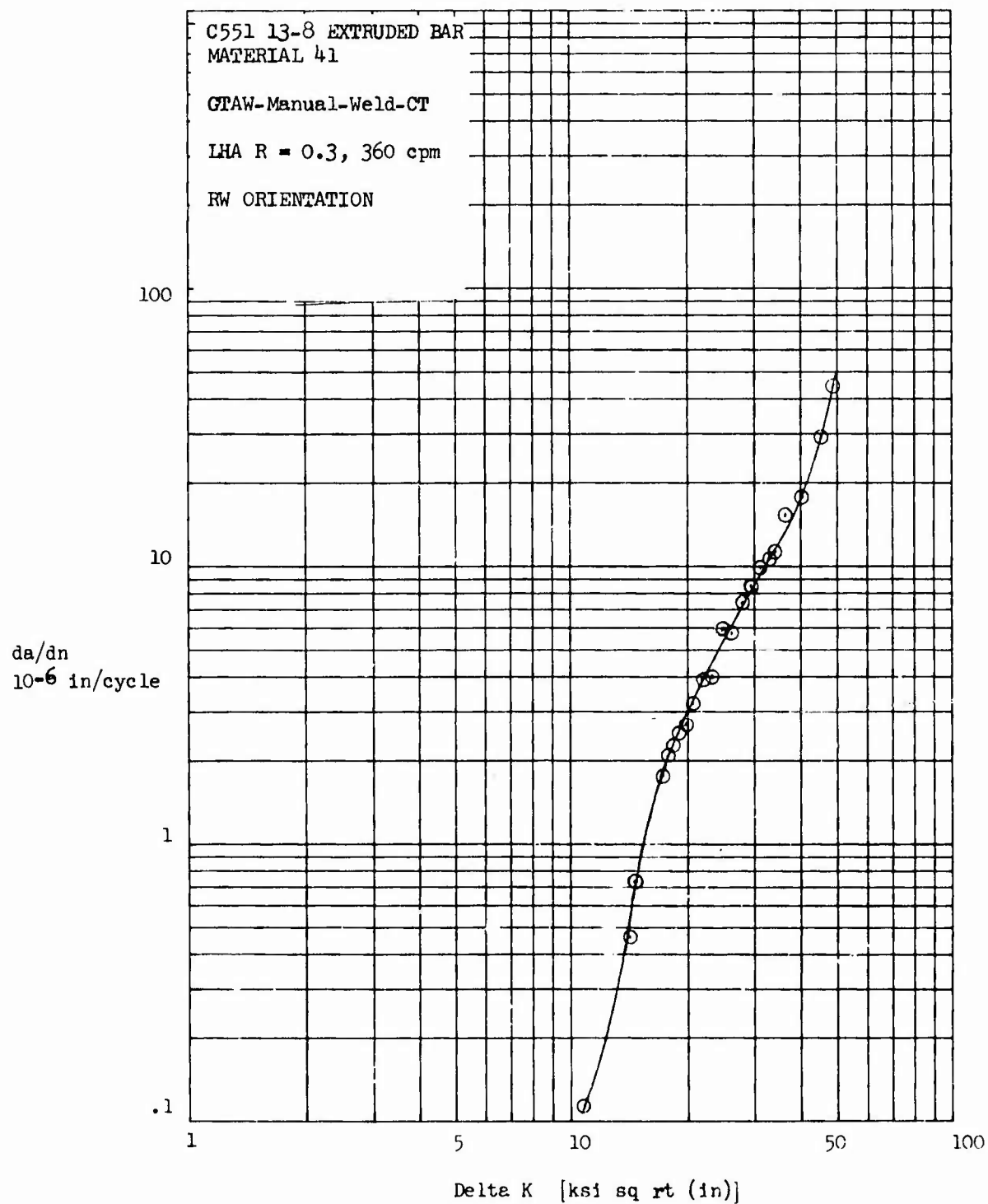


Figure 41 NRW C551

Fatigue Crack Growth Rate in the Weld Metal of
Welded 13-8 Extruded Bar CT Specimen in LHA

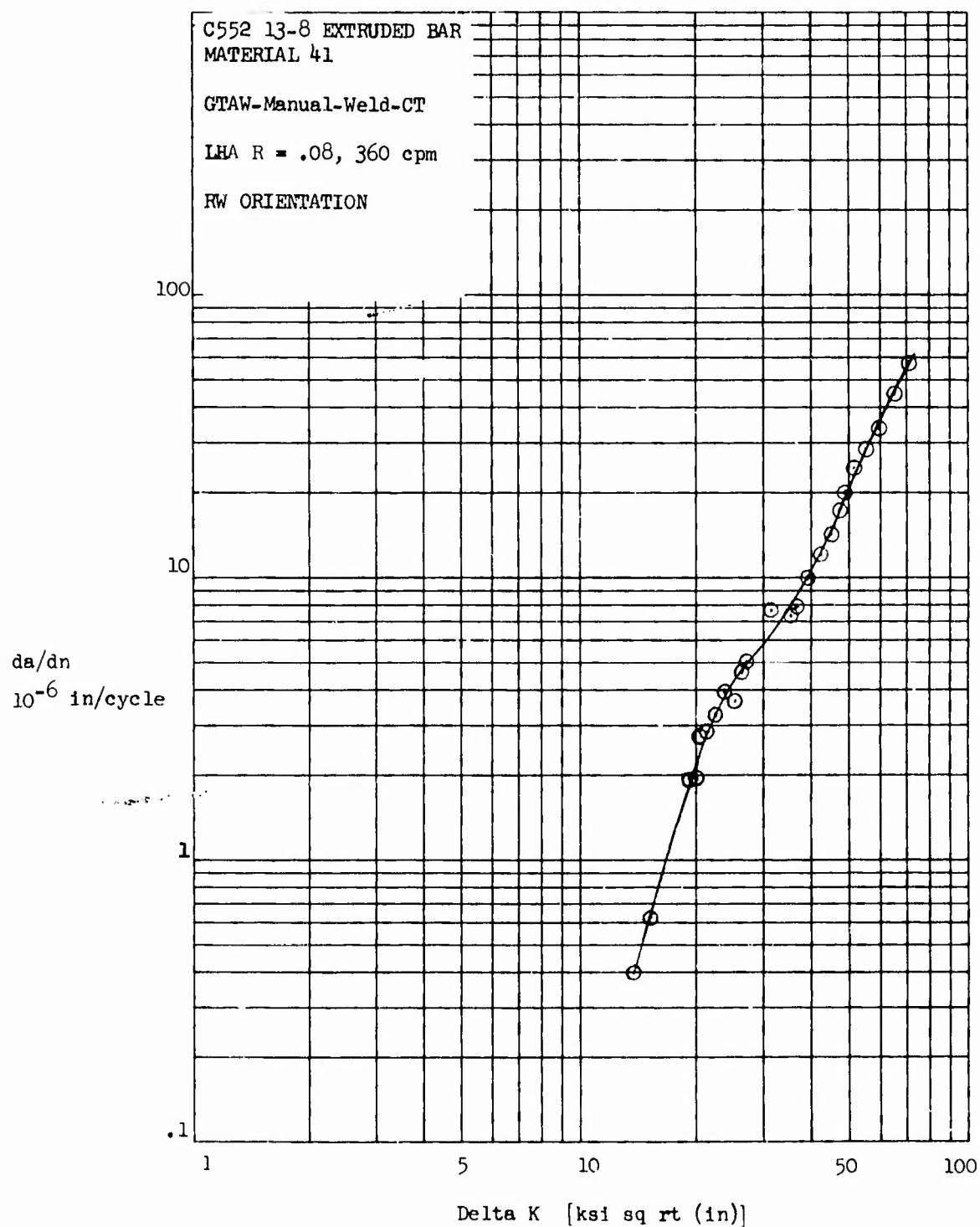


Figure 41 NRW C552

Fatigue Crack Growth Rate in the Weld Metal of a
Welded 13-8 Extruded Bar CT Specimen in LHA

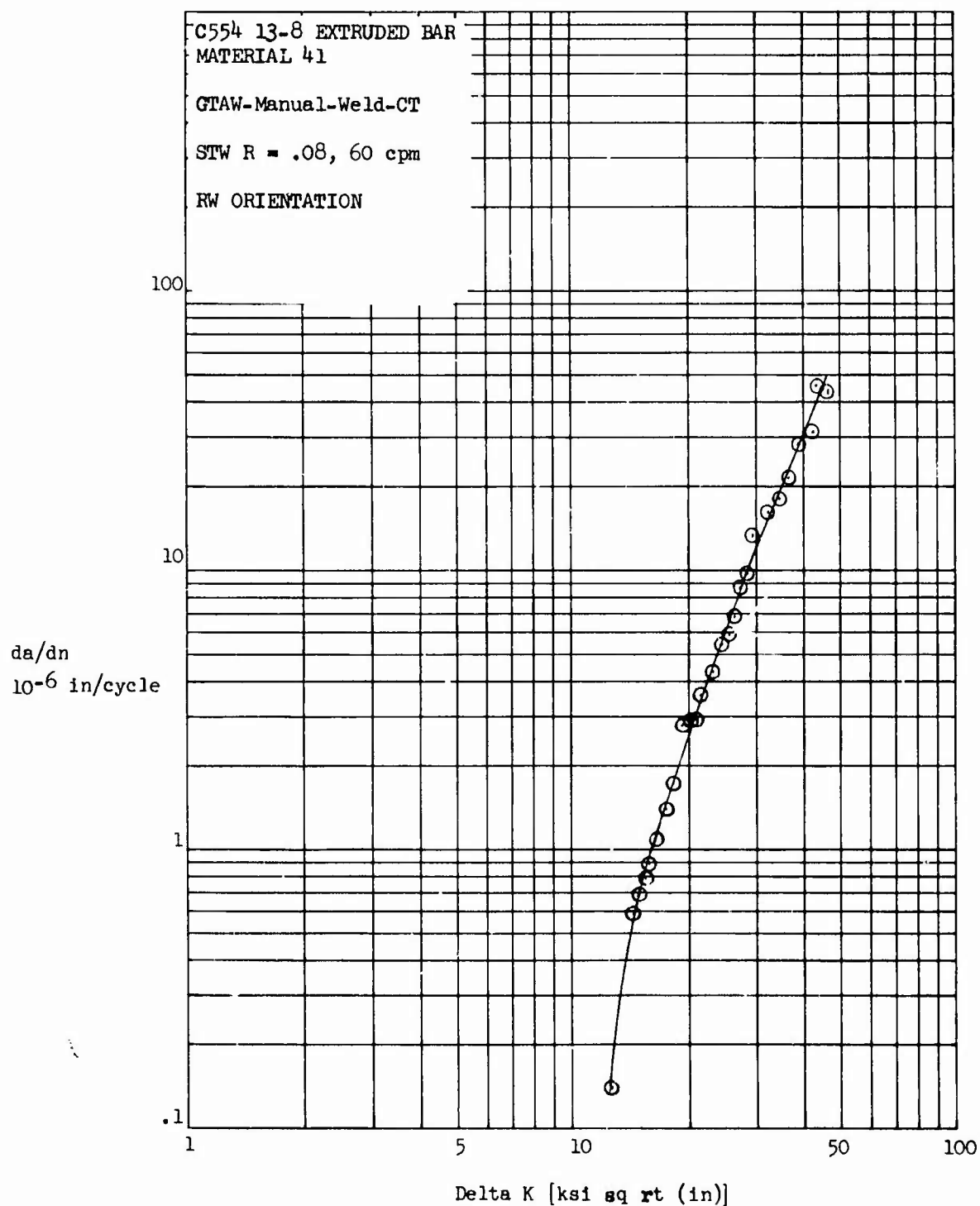


Figure 41 NRW C554

Fatigue Crack Growth Rate in the Weld Metal of a
Welded 13-8 Extruded Bar CT Specimen in STW

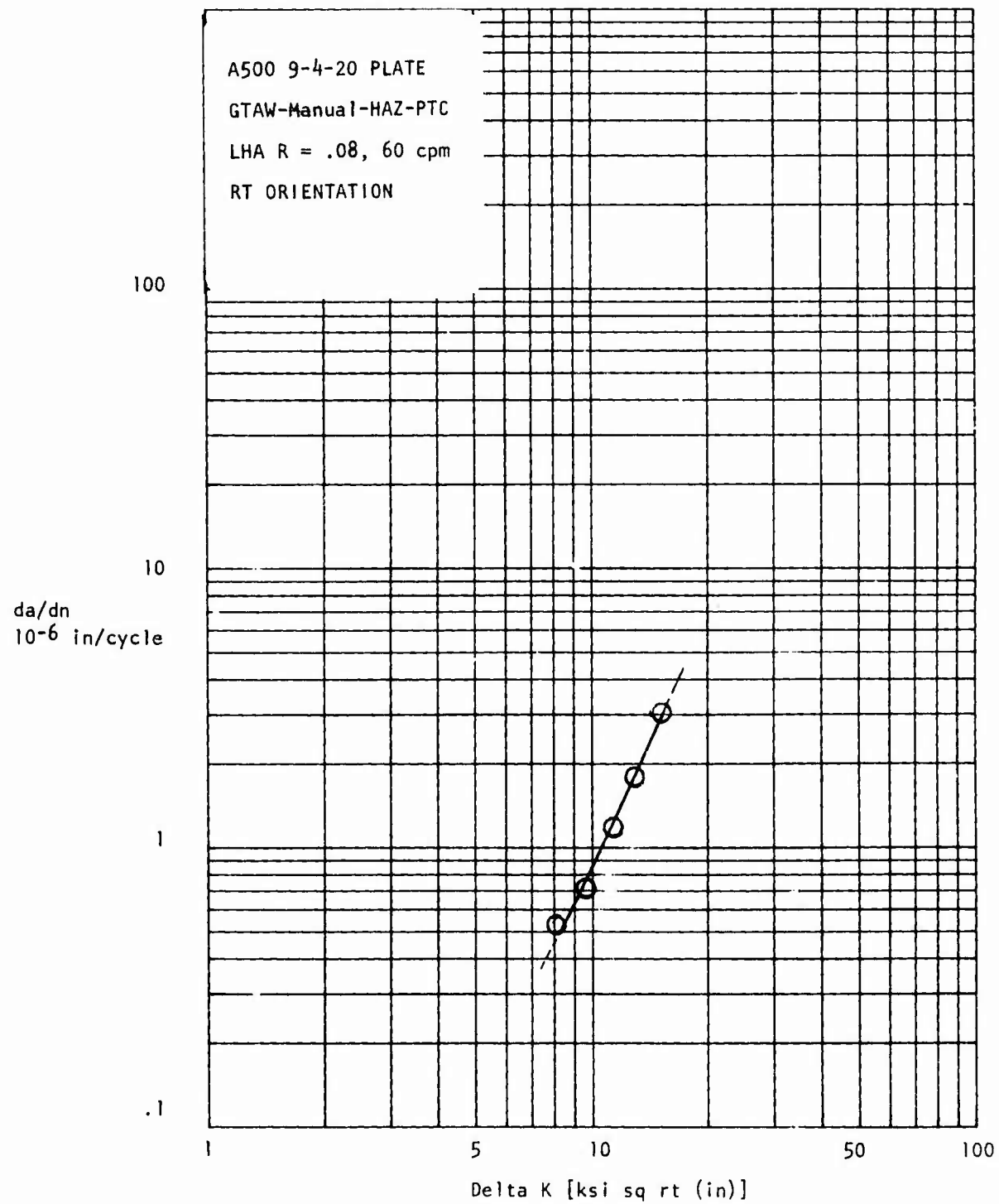


Figure 57 NRT A500 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in LHA

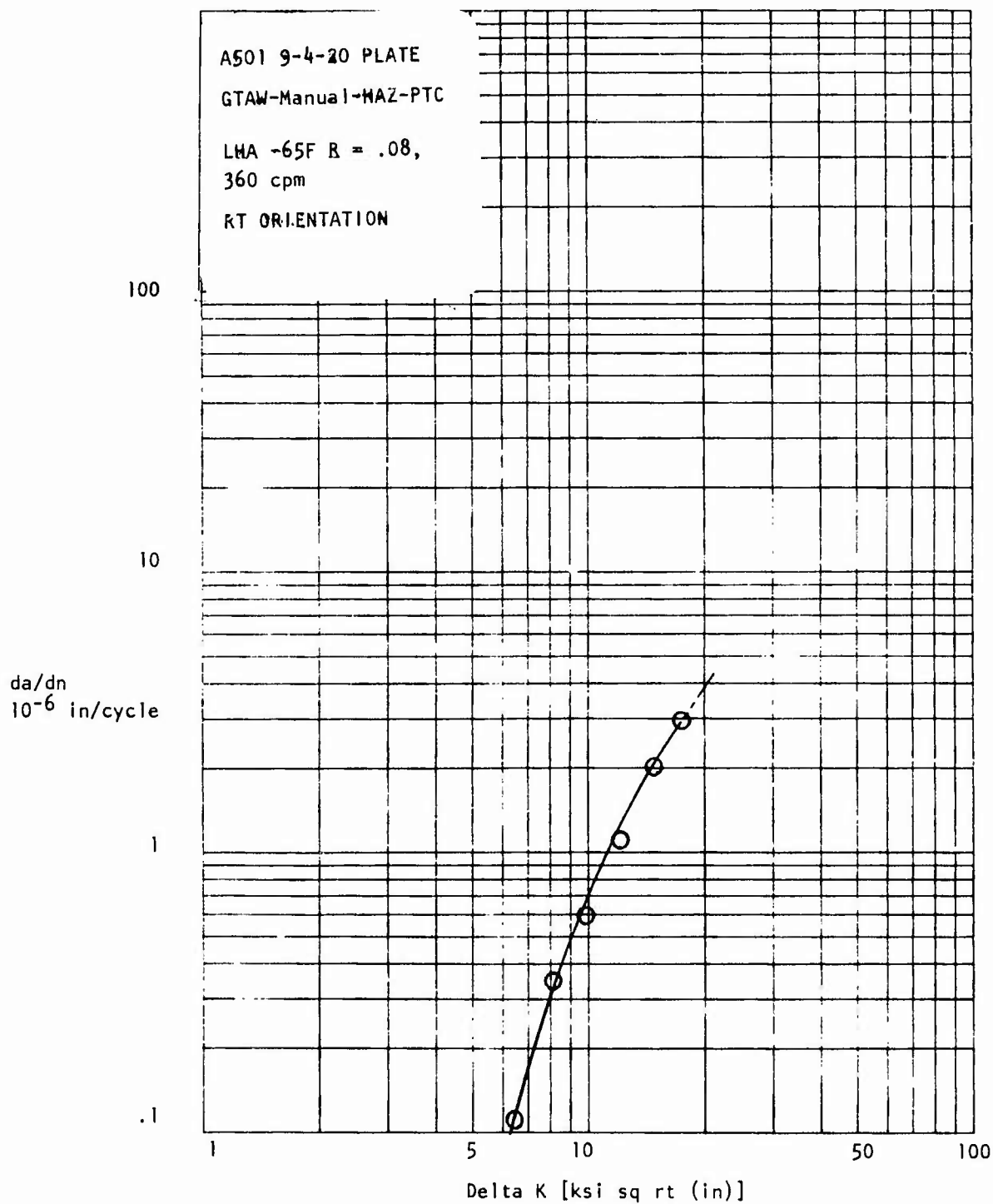


Figure 57 NRT A501

Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in LHA at -65F

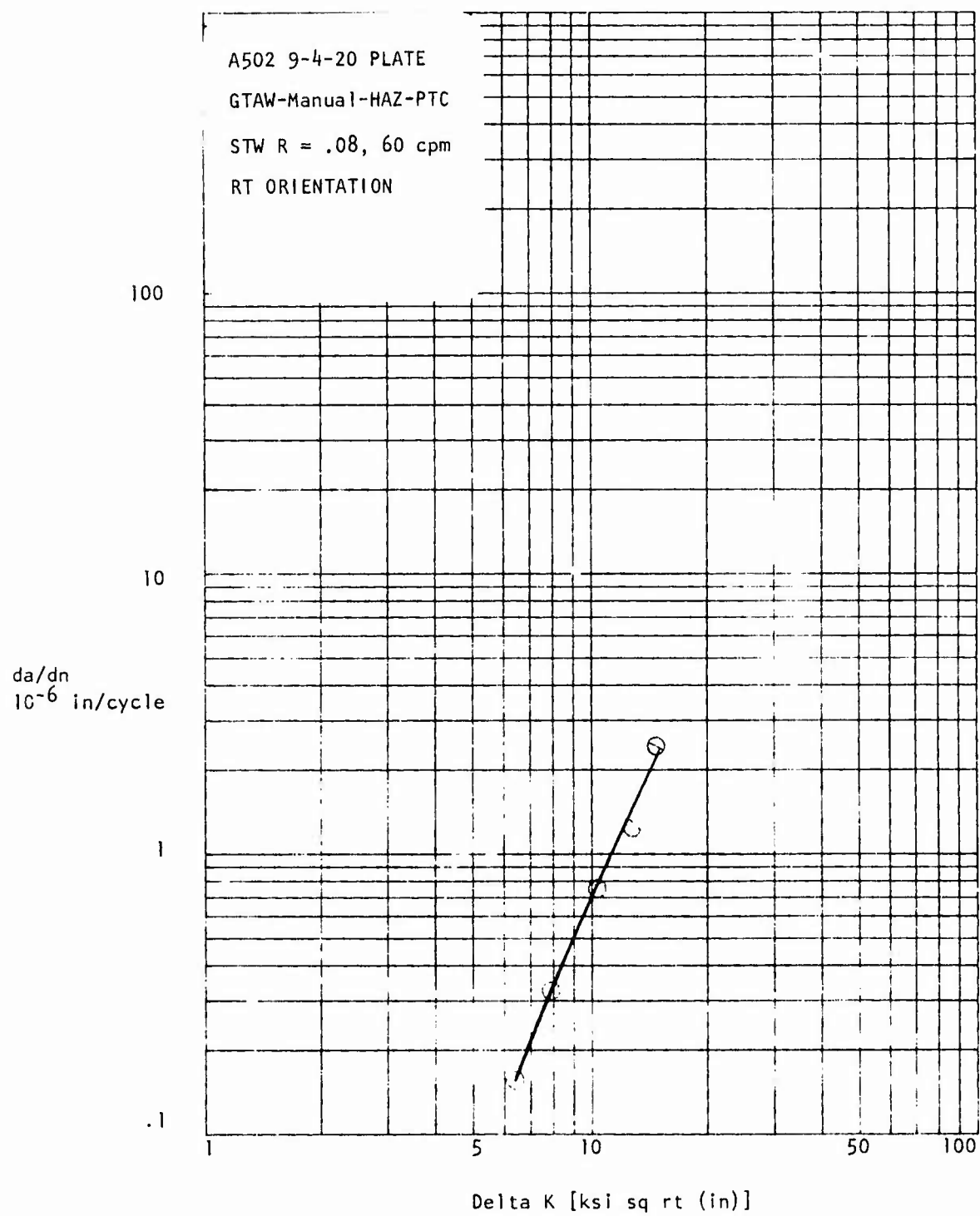


Figure 57 NRT A502 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in STW

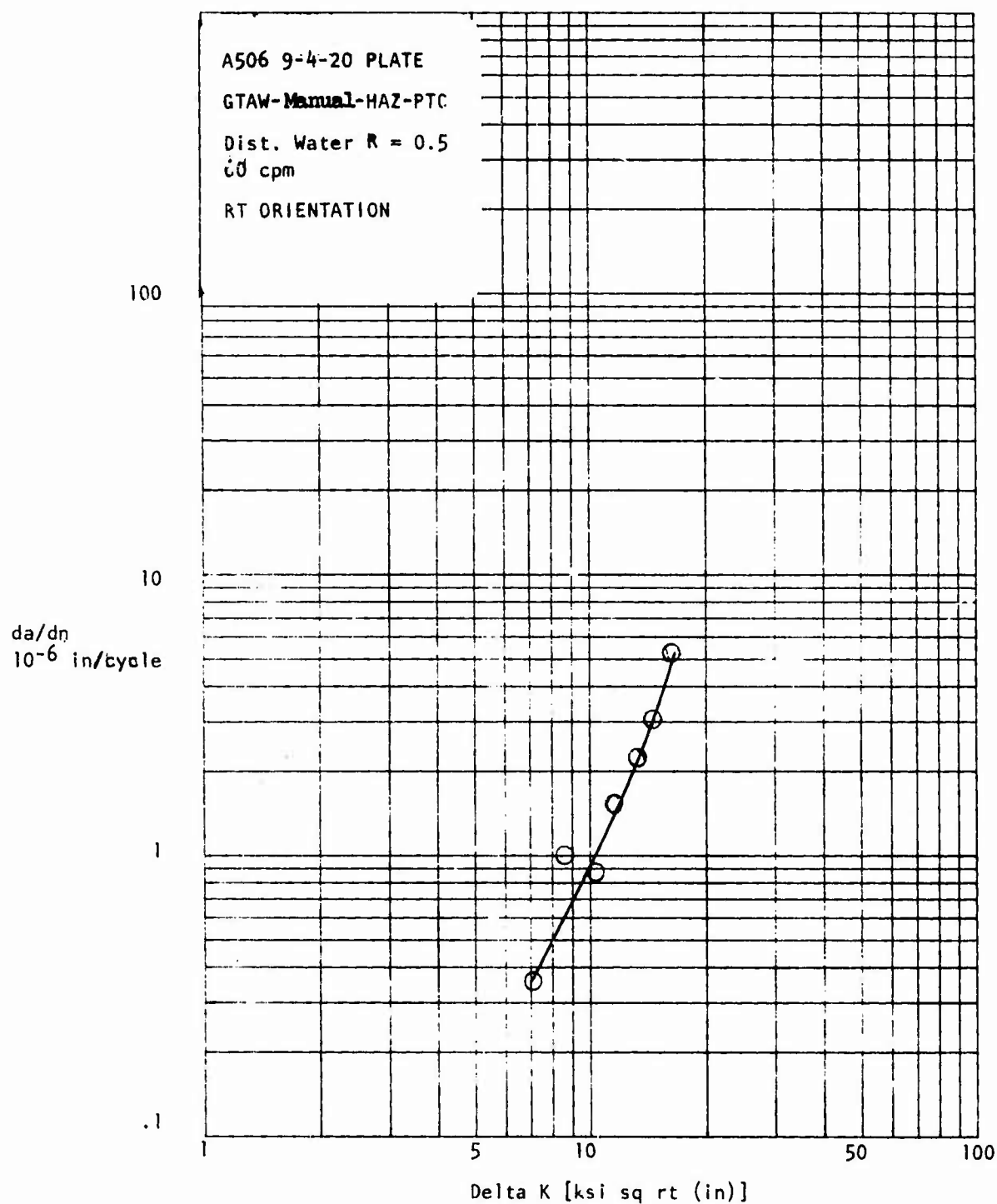


Figure 57 NRT A506 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in Distilled Water

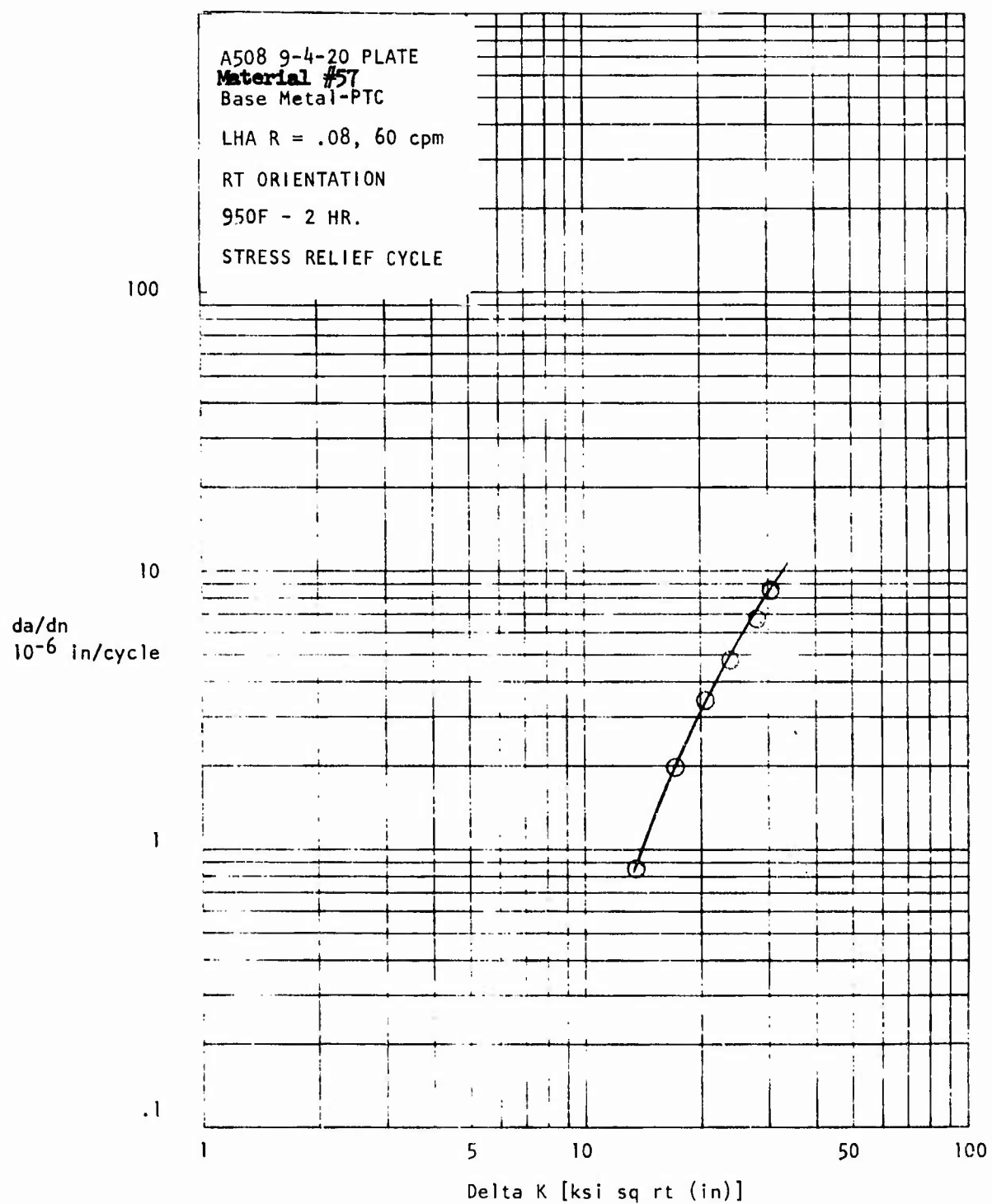


Figure 57 NRT A508 Fatigue Crack Growth Rate in the Base Metal of a 9-4-20 PTC Specimen in LHA

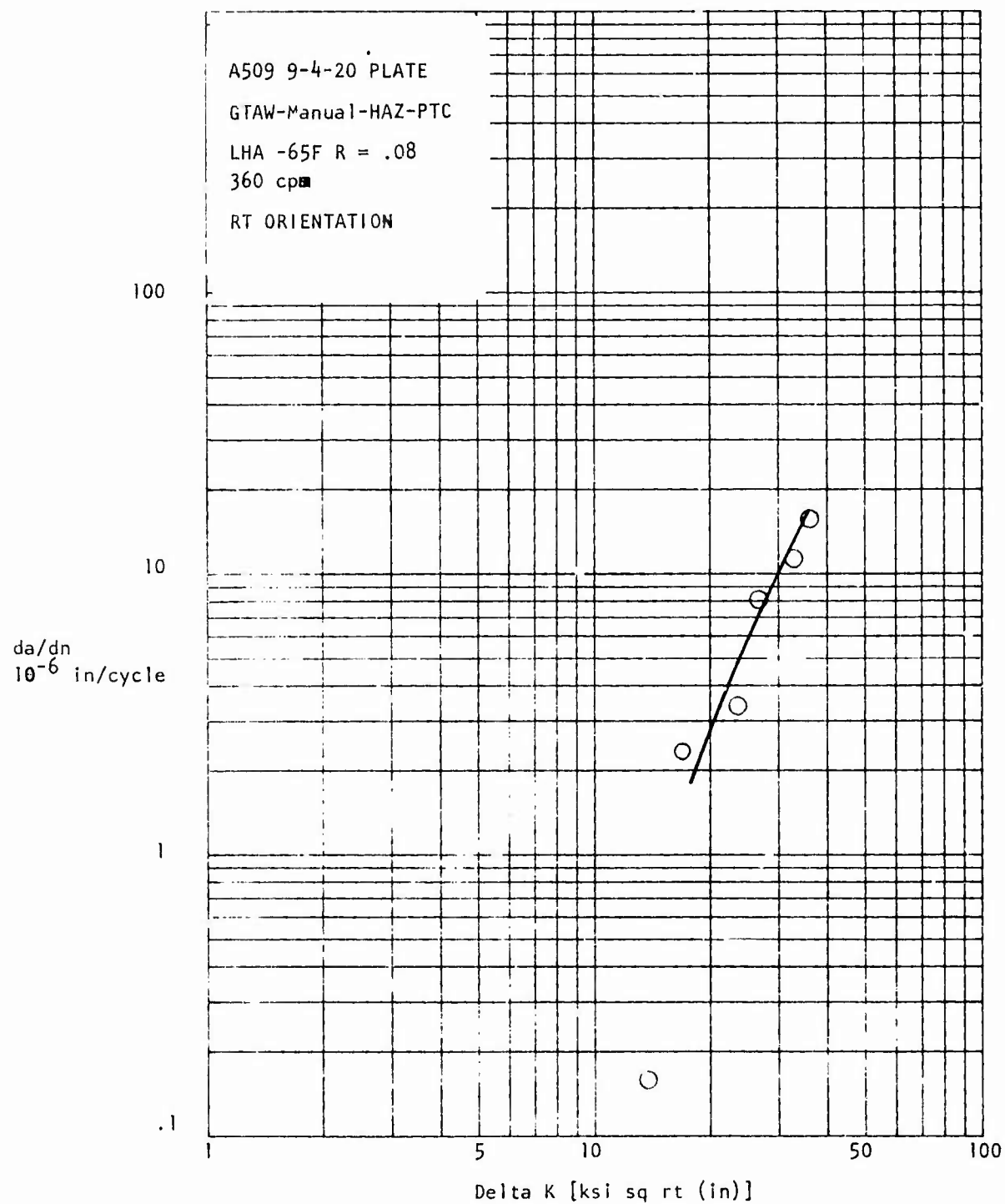


Figure 57 NRT A509 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in LHA at -65F

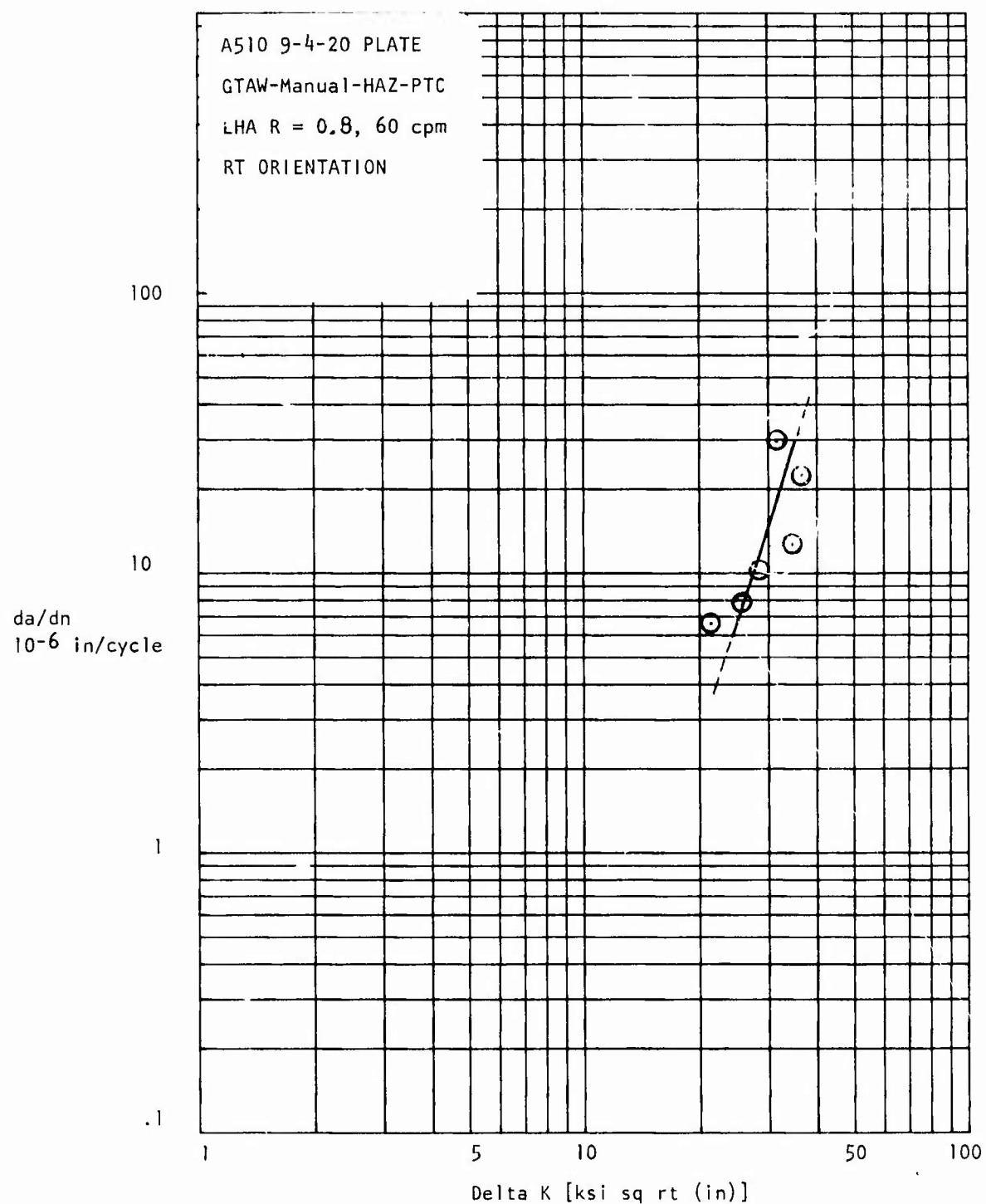


Figure 57 NRT A510 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in LHA

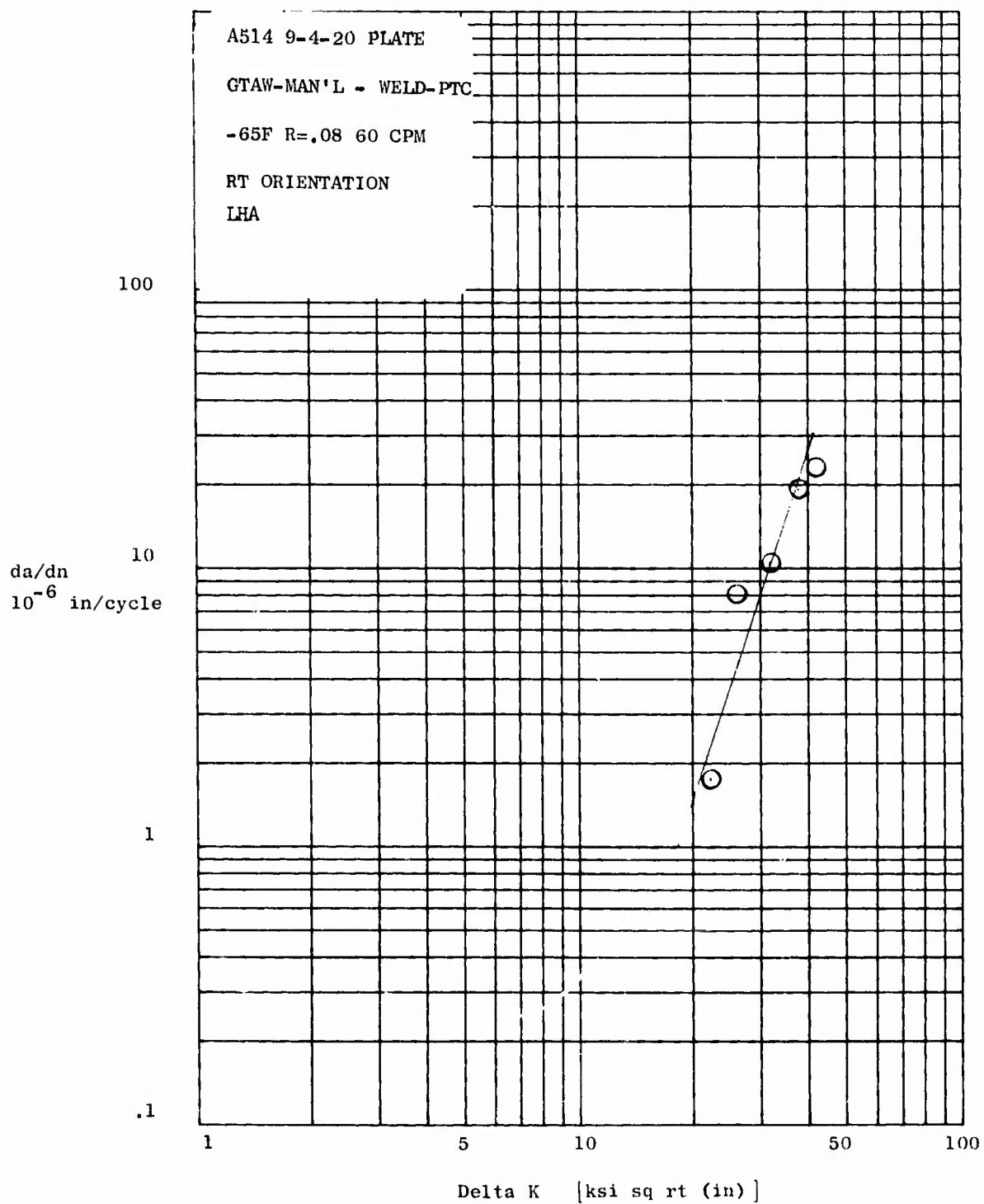


Figure 57 NRT A514 Fatigue Crack Growth Rate At -65F In The Weld Of A Welded 9-4-20 Plate PTC Specimen.

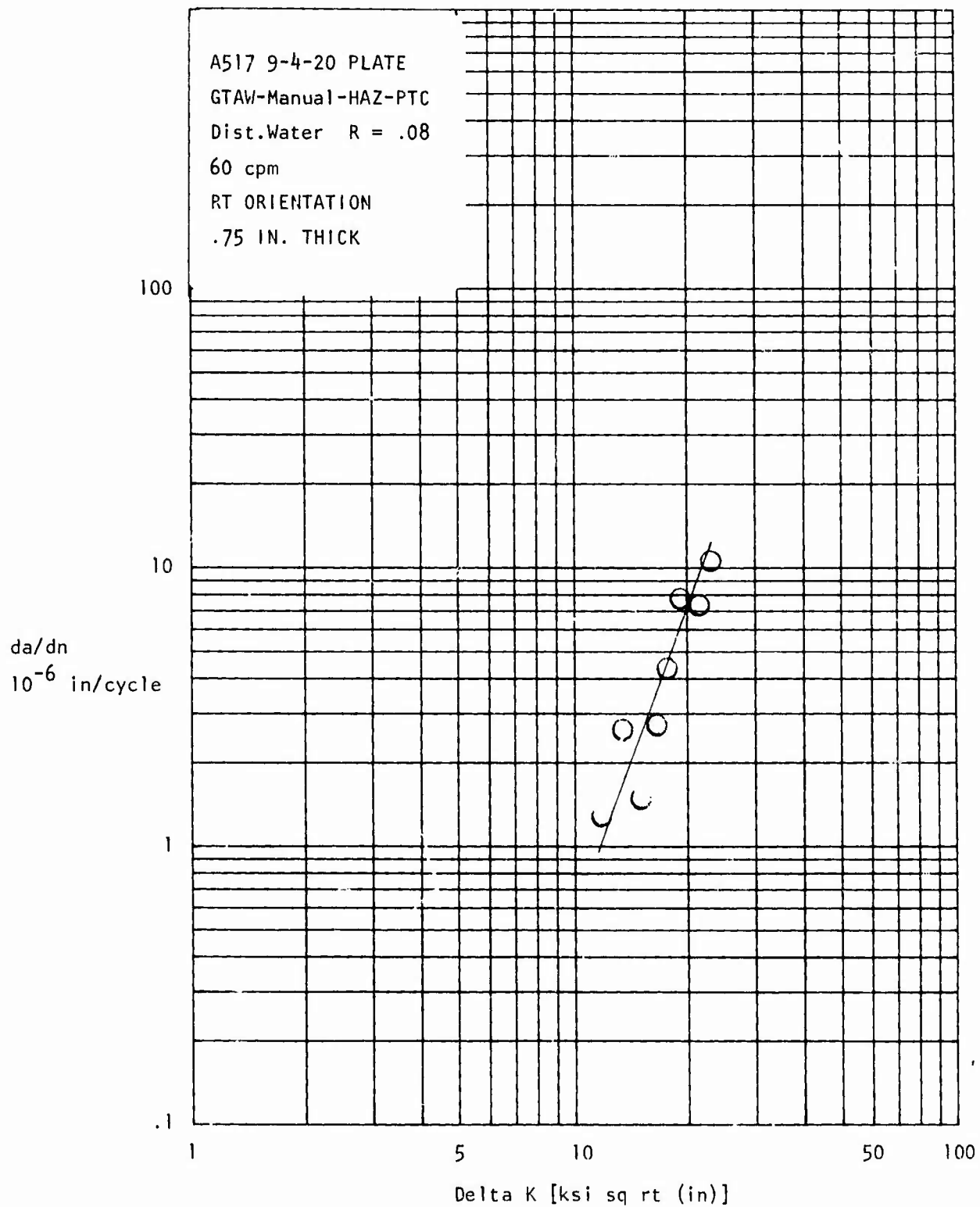


Figure 57 NRT A517 . Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in Distilled Water

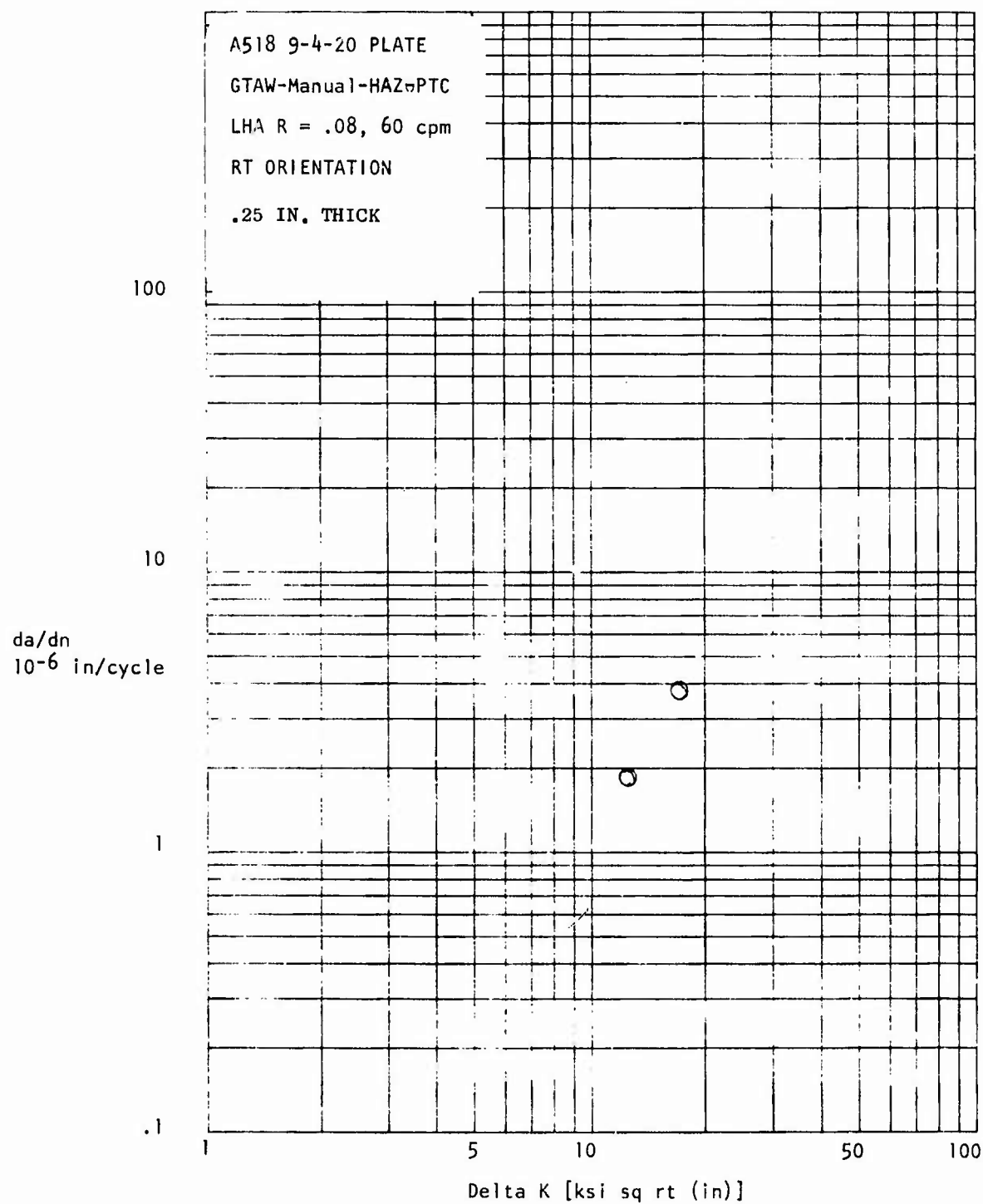


Figure 57 NRT A518 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in LHA

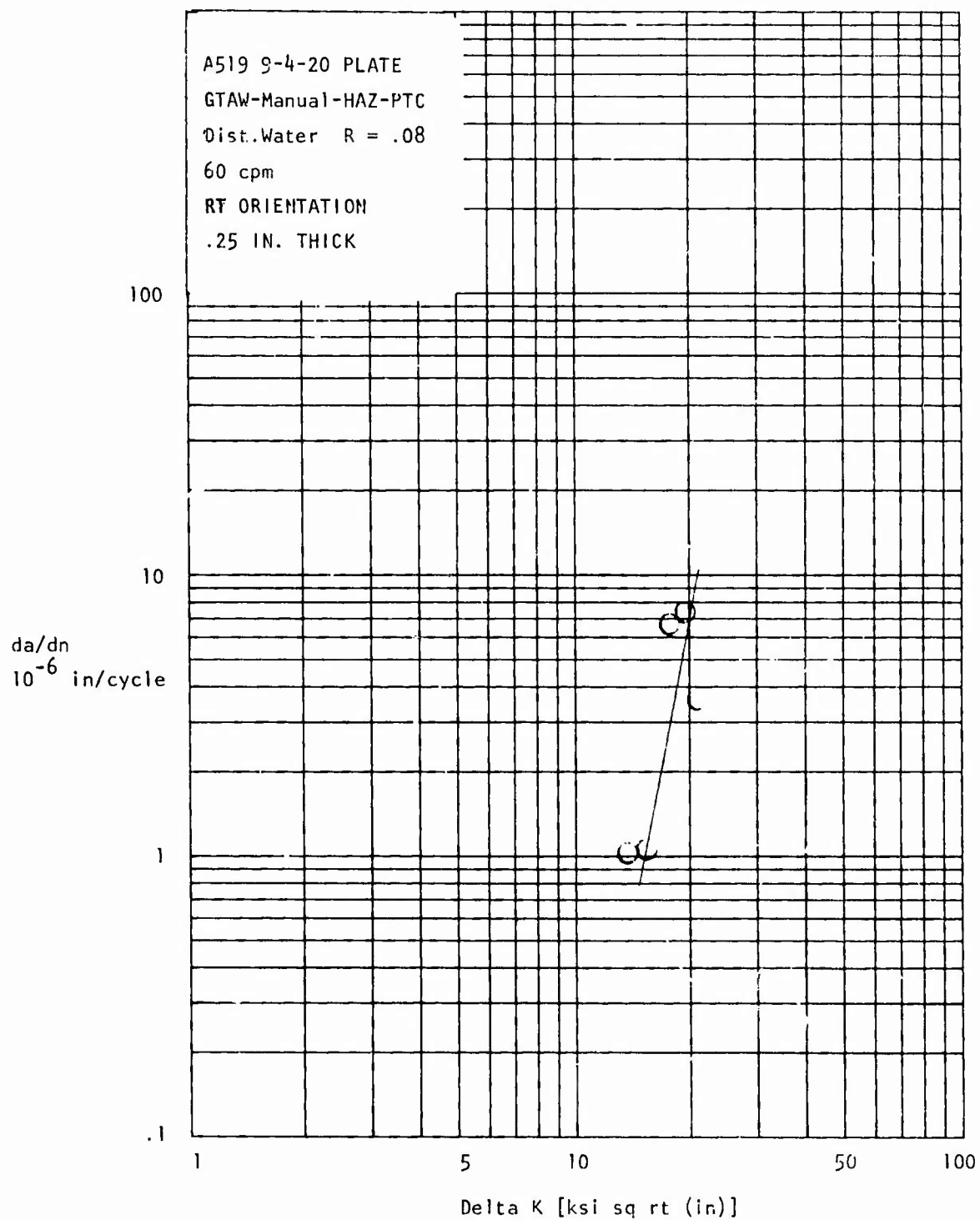


Figure 57 NRT A519 . Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in Distilled Water

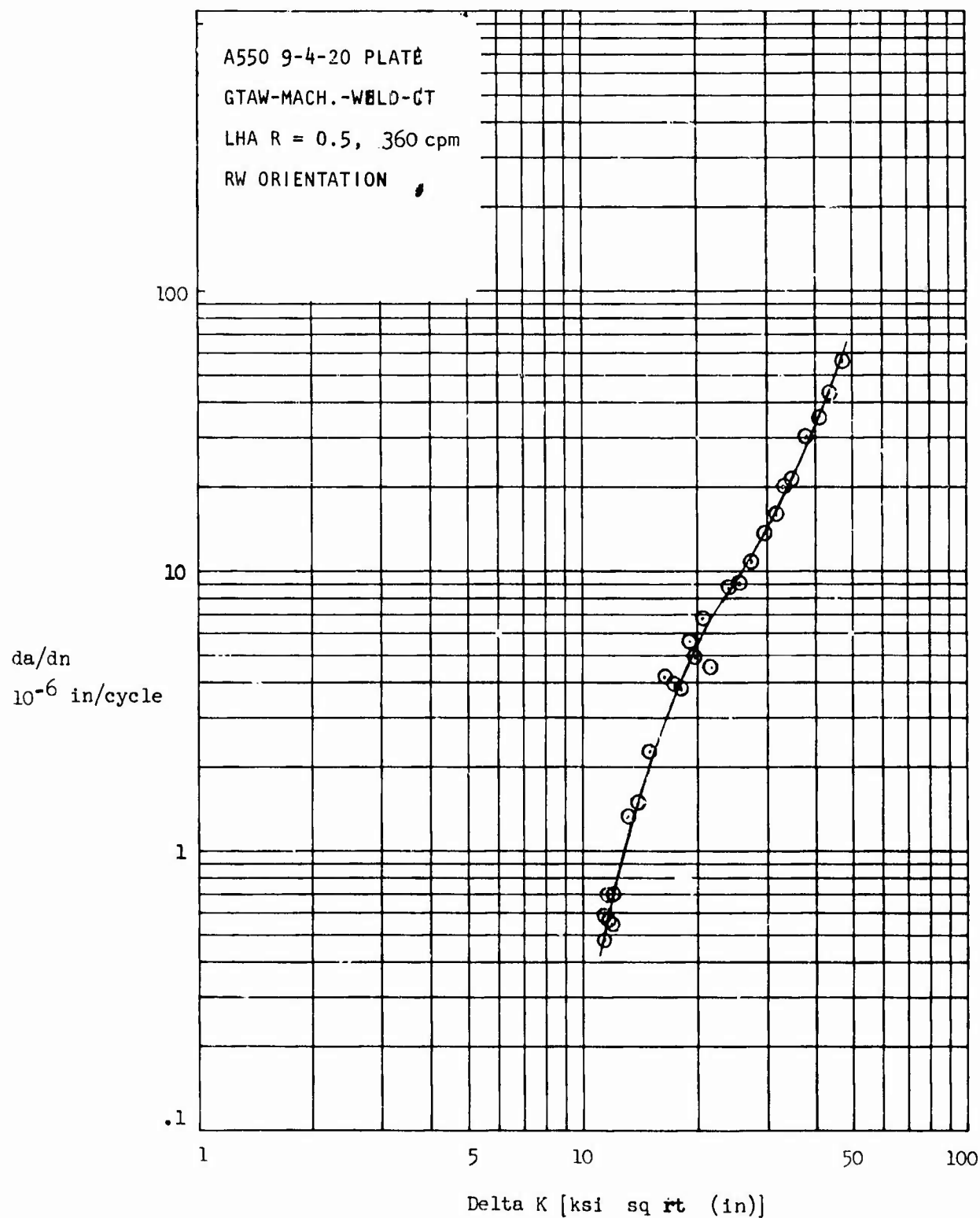


Figure 57 NRW A550

Fatigue Crack Growth Rate in the Weld Metal of A
Welded 9-4-20 Plate CT Specimen in LHA

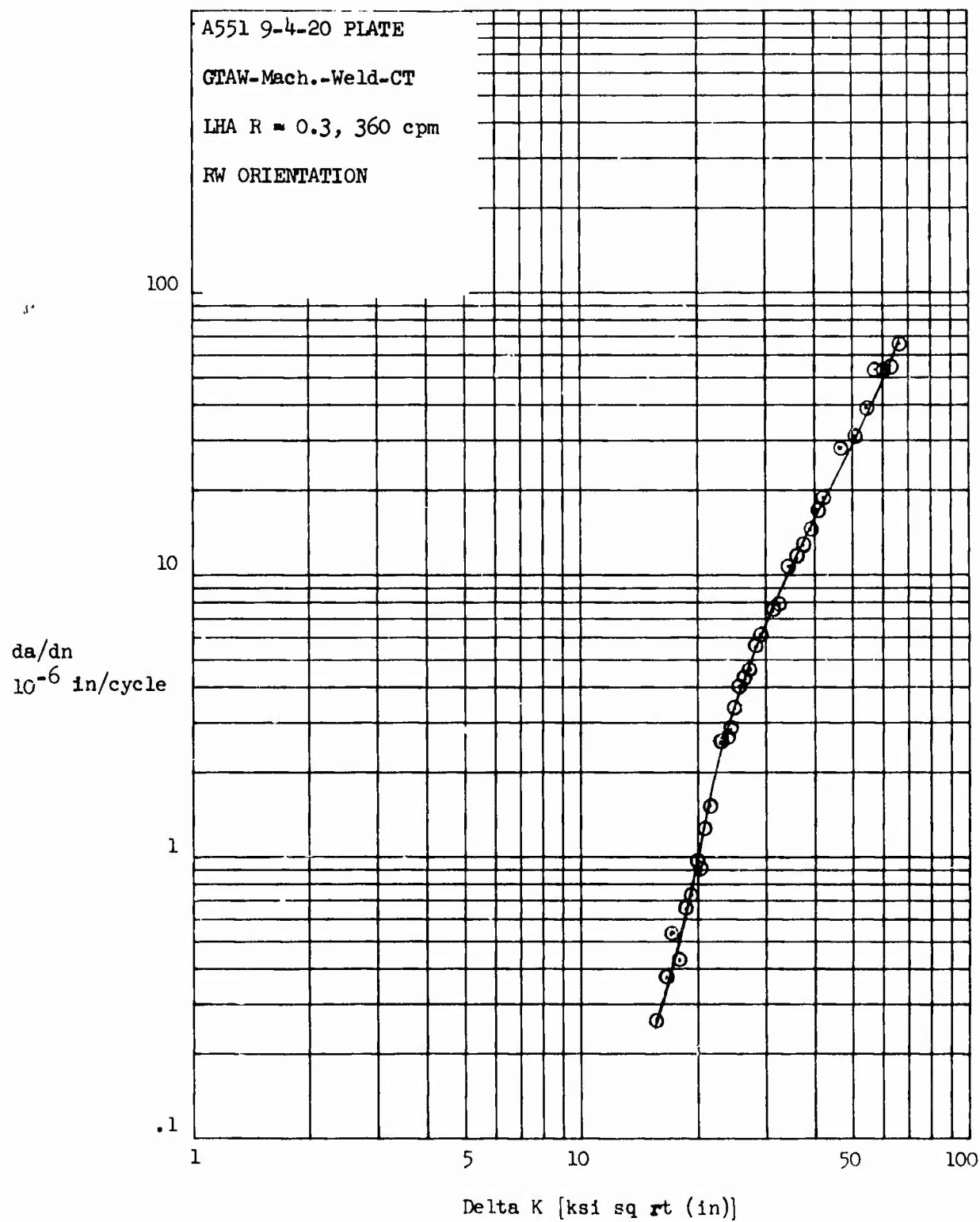


Figure 57 NRW A551

Fatigue Crack Growth Rate in the Weld Metal of a
Welded 9-4-20 Plate CT Specimen in LHA

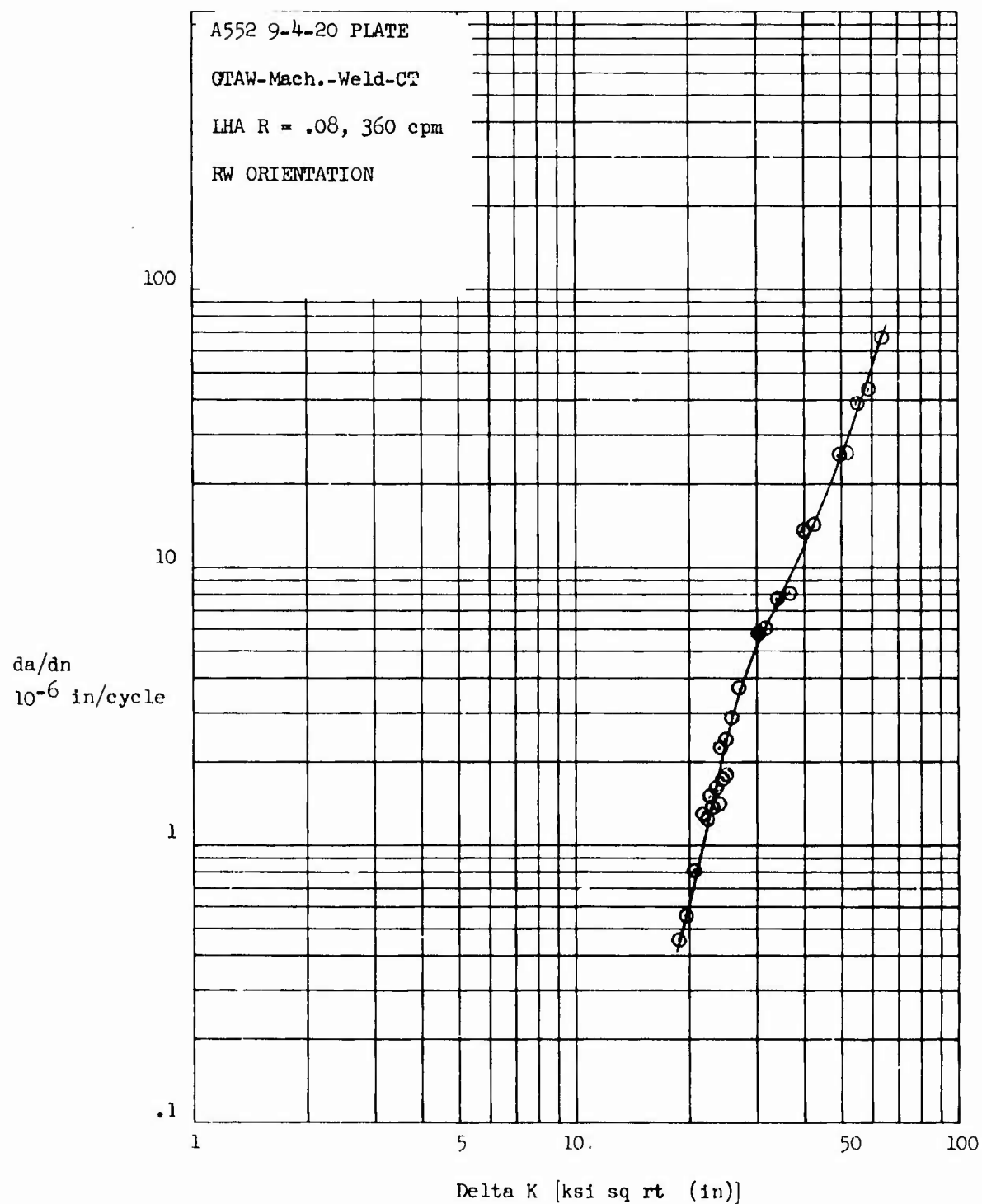


Figure 57 NRW A552 Fatigue Crack Growth Rate in the Weld Metal of a Welded 9-4-20 Plate CT Specimen in LHA

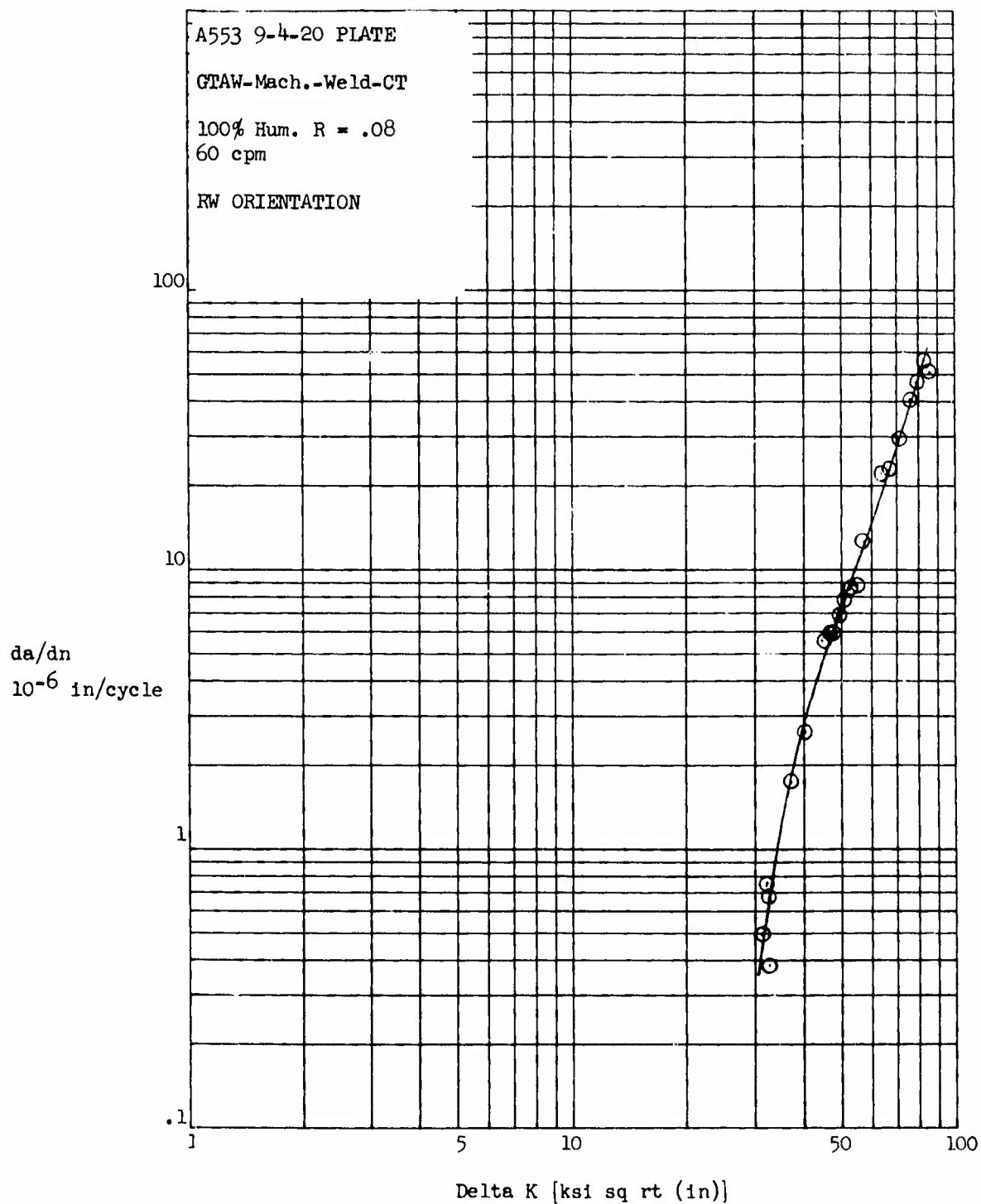


Figure 57 NRW A553 Fatigue Crack Growth Rate in the Weld Metal of a Welded 9-4-20 Plate CT Specimen in 100% Humidity

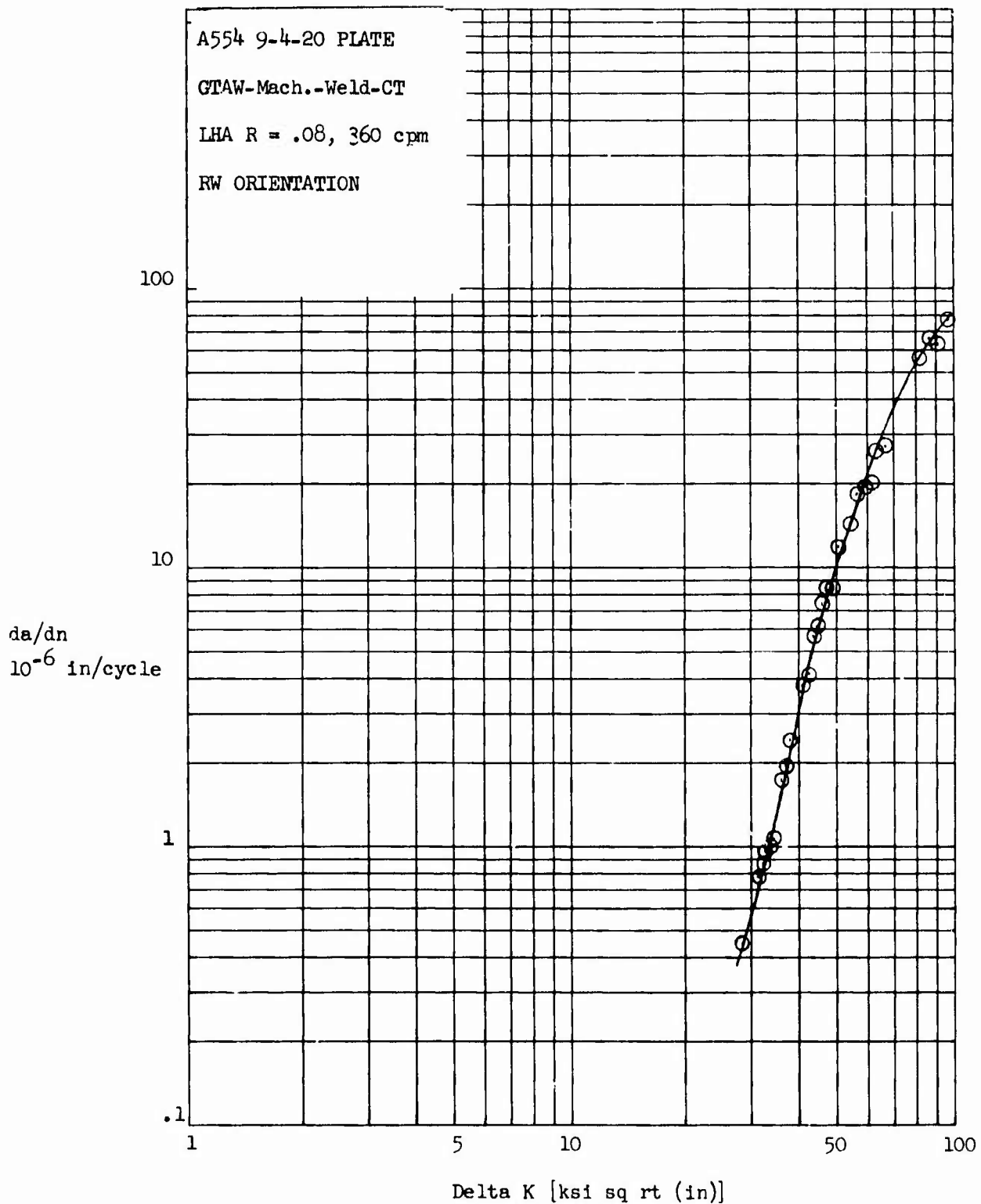


Figure 57 NRW A554

Fatigue Crack Growth Rate in the Weld Metal of a Welded
 9-4-20 Plate CT Specimen in LHA

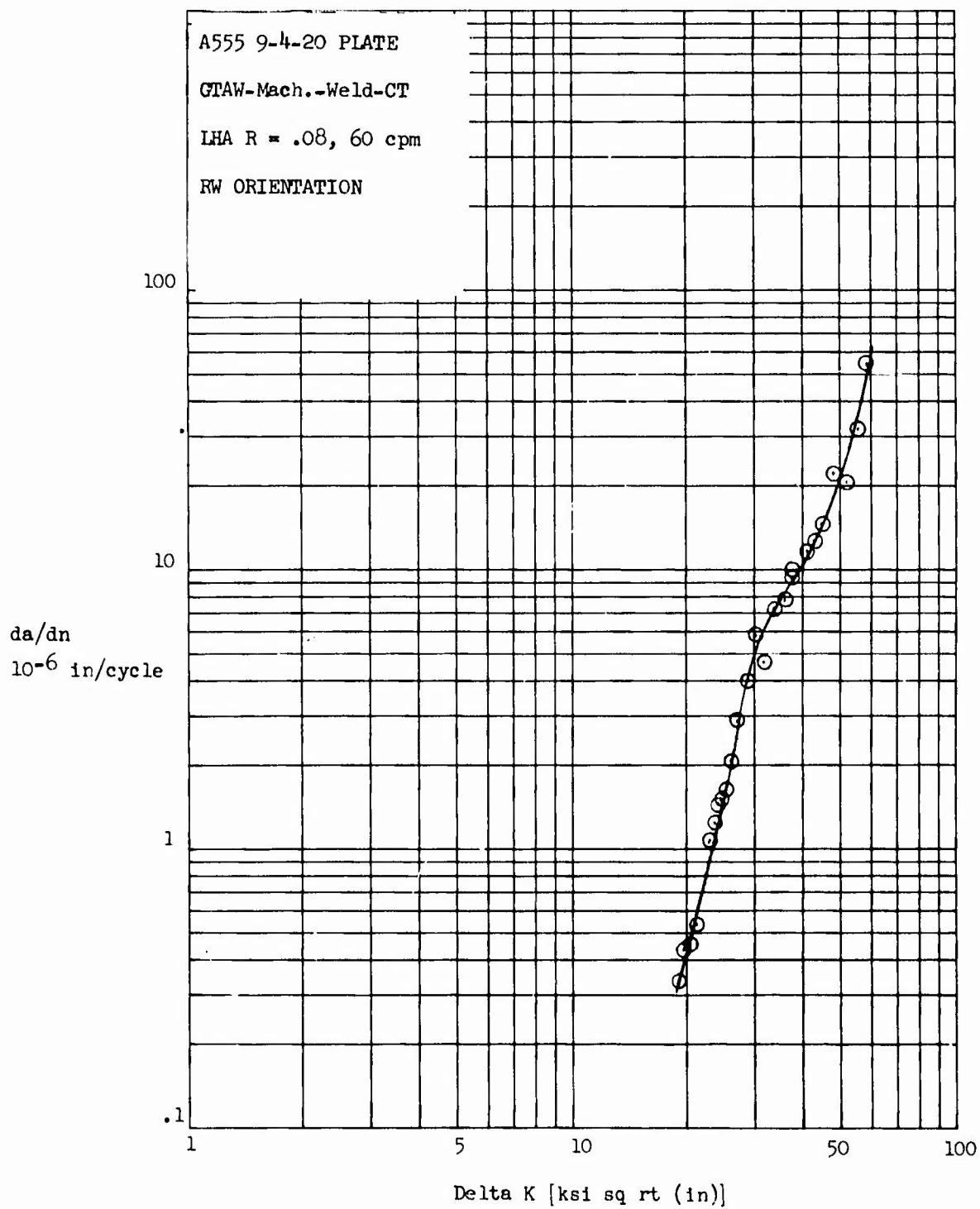


Figure 57 NRW A555

Fatigue Crack Growth Rate in the Weld Metal of a
Welded 9-4-20 Plate CT Specimen in LHA

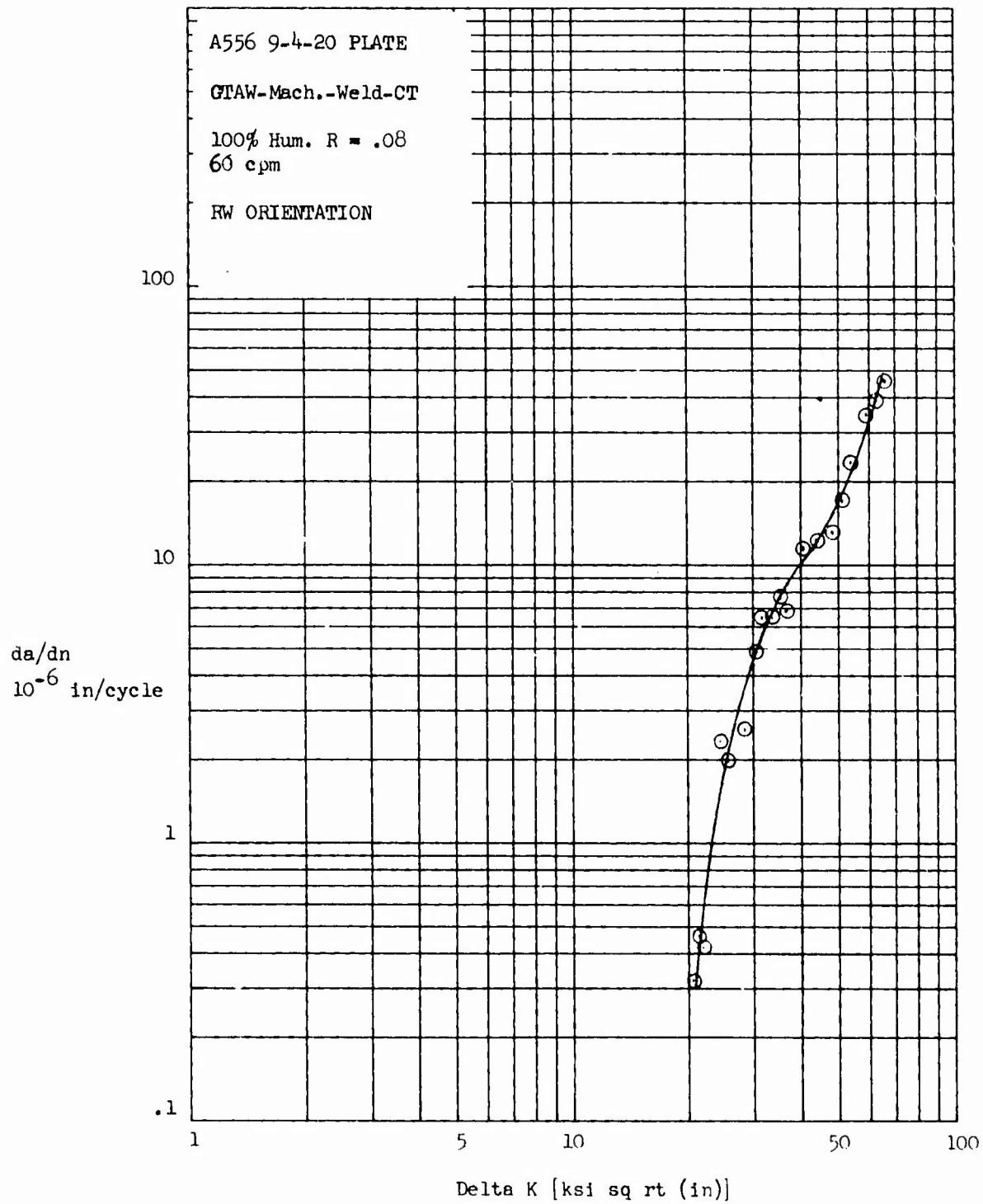


Figure 57 NRW A556

Fatigue Crack Growth Rate in the Weld Metal of a
Welded 9-4-20 Plate CT Specimen in 100% Humidity

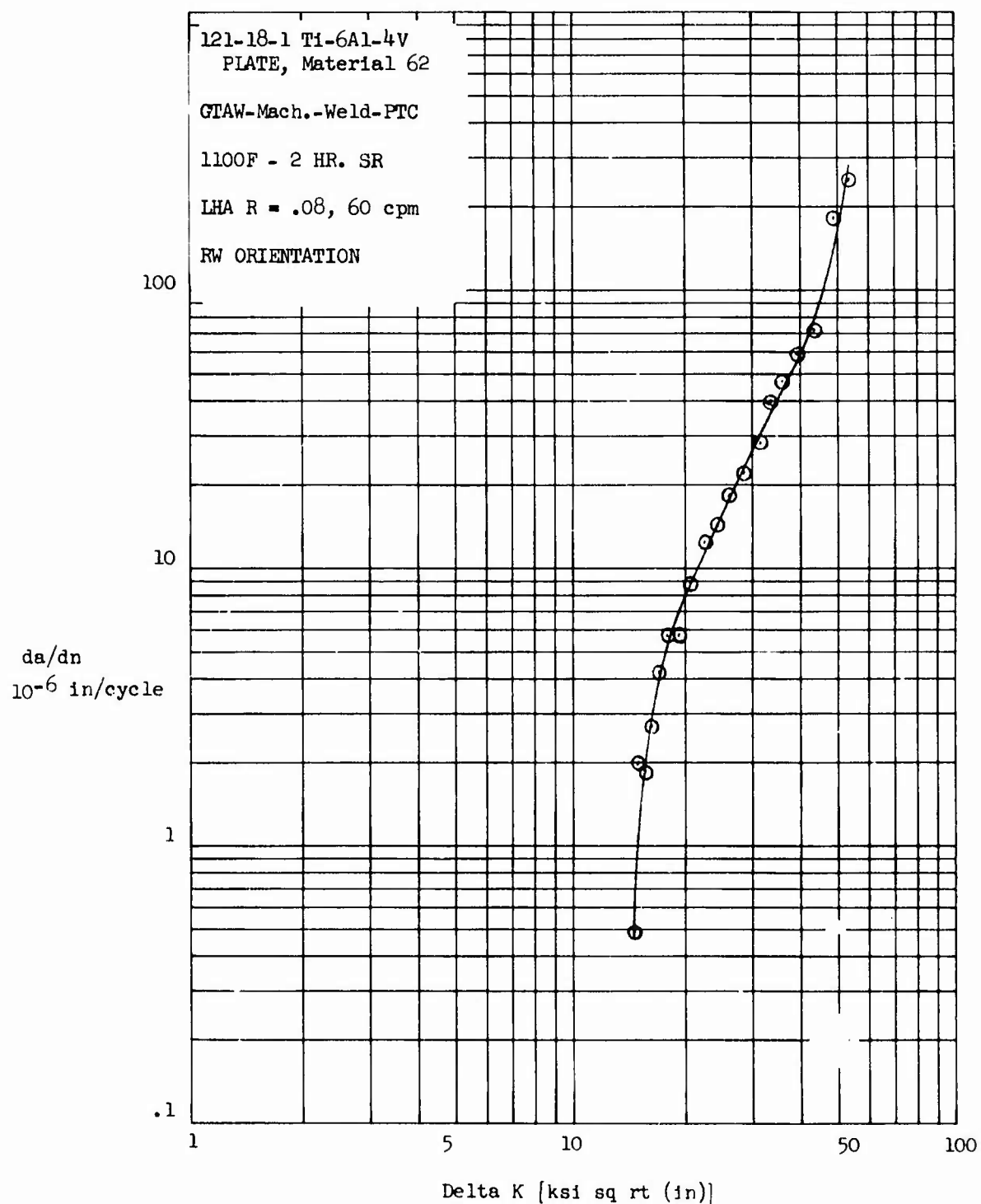


Figure 62 NRW 121-18-1 Fatigue Crack Growth Rate in the Weld Metal of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

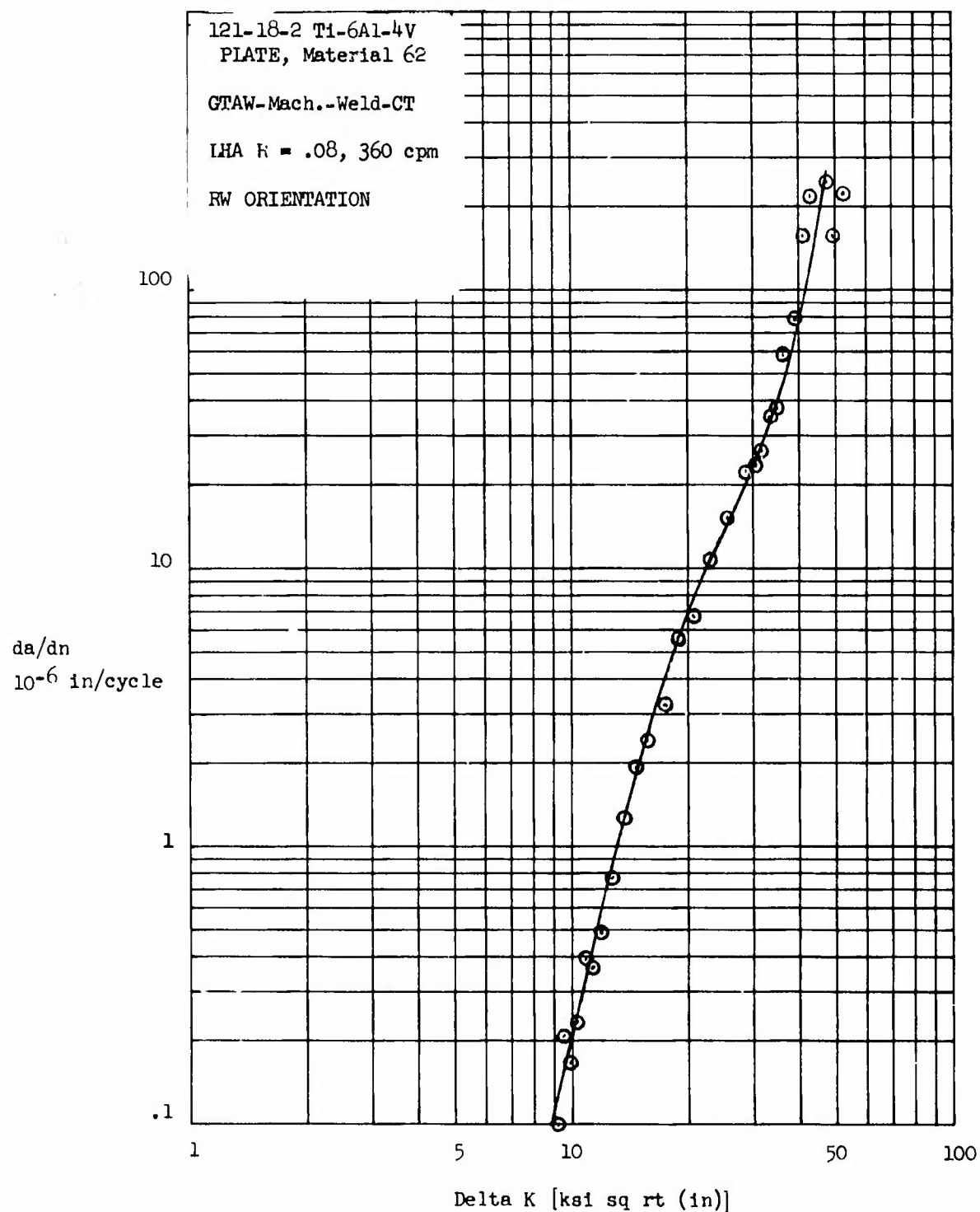


Figure 62 NRW 121-18-2 Fatigue Crack Growth Rate in the Weld Metal of a Welded Ti-6Al-4V Plate CT Specimen in LHA

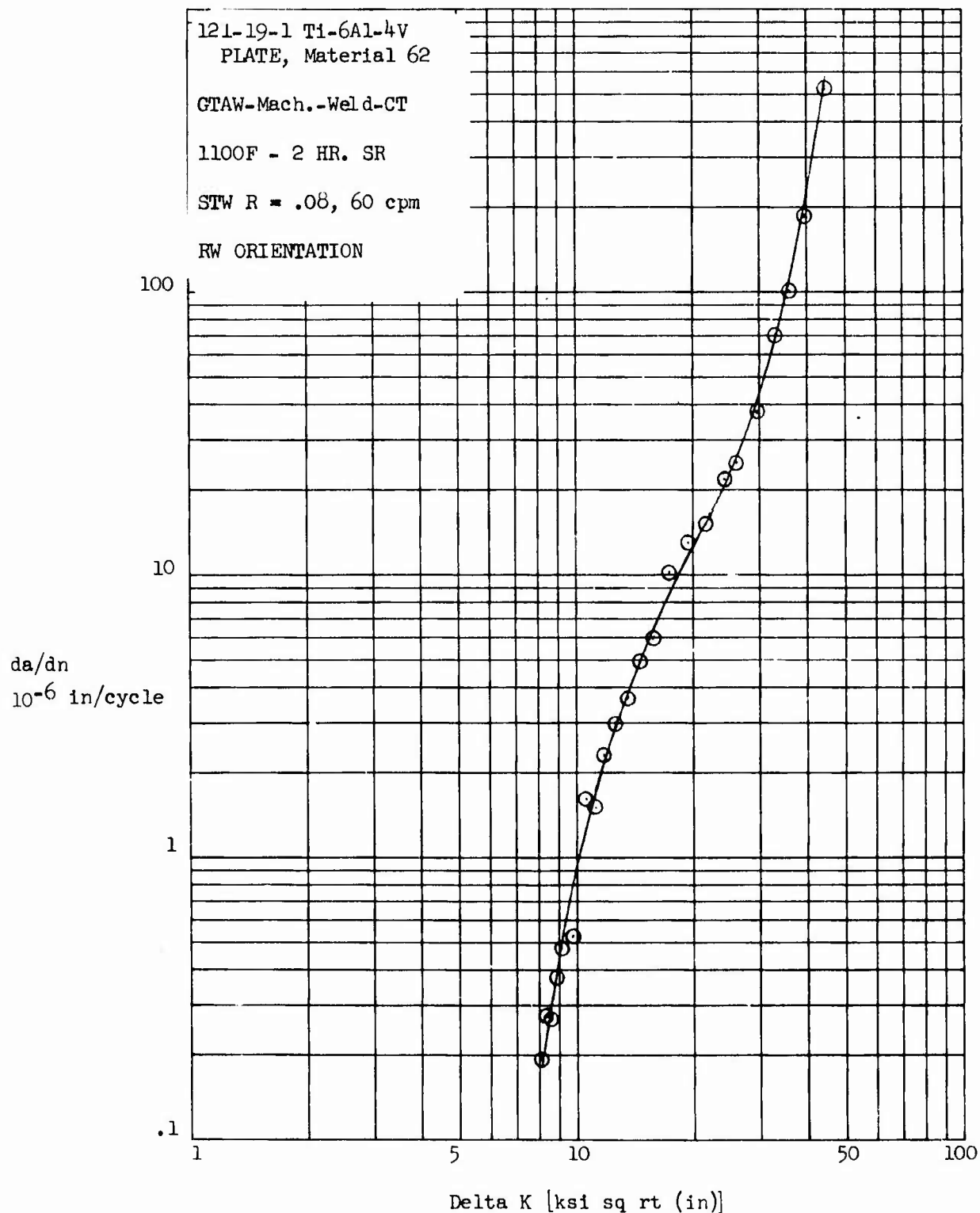


Figure 62 NRW 121-19-1 Fatigue Crack Growth Rate in the Weld Metal of a Welded Ti-6Al-4V Plate CT Specimen in STW

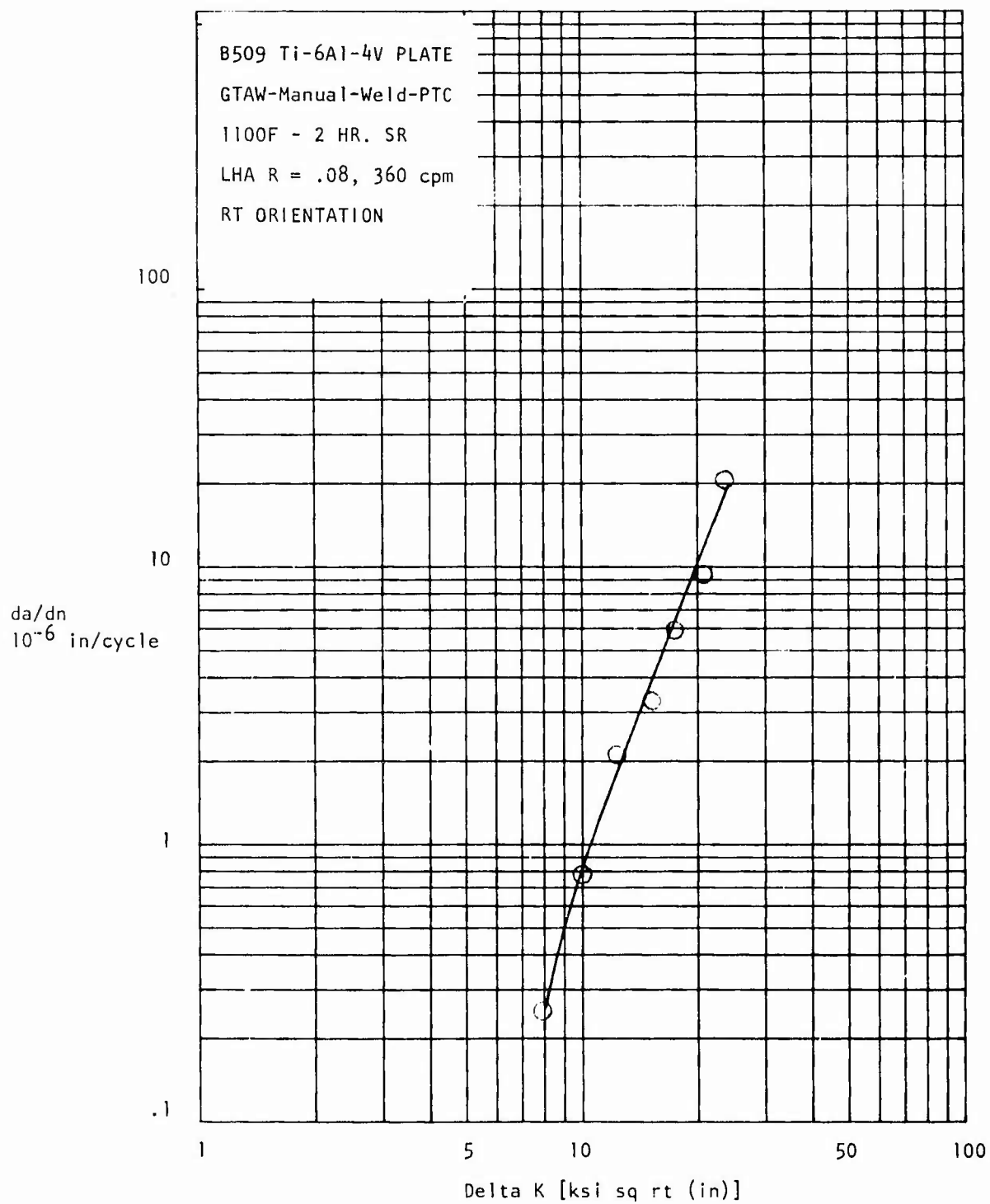


Figure 70 NRT B509

Fatigue Crack Growth Rate in the Weld of a Welded
Ti-6Al-4V Plate PTC Specimen in LHA

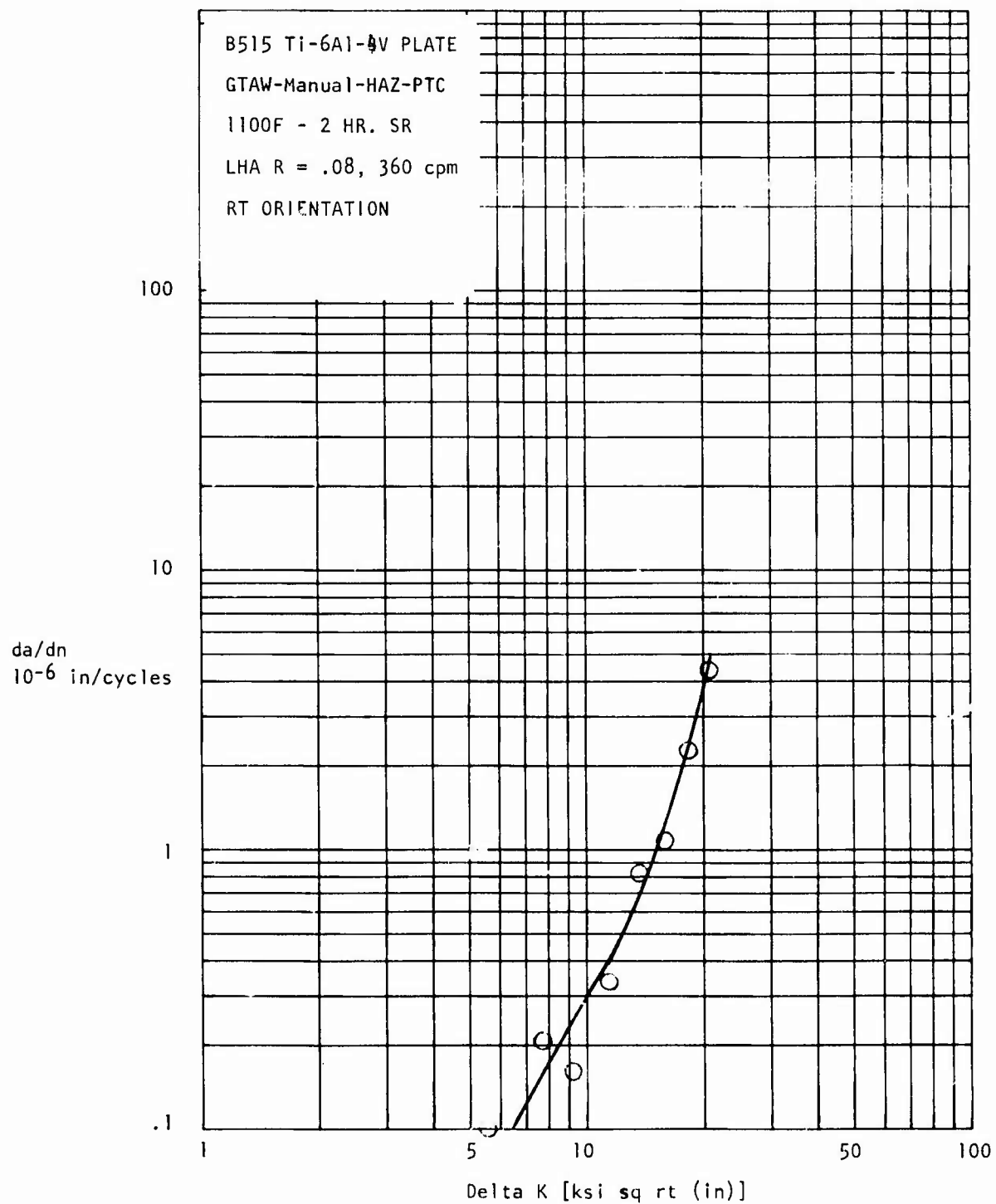


Figure 75 NRT B515

Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

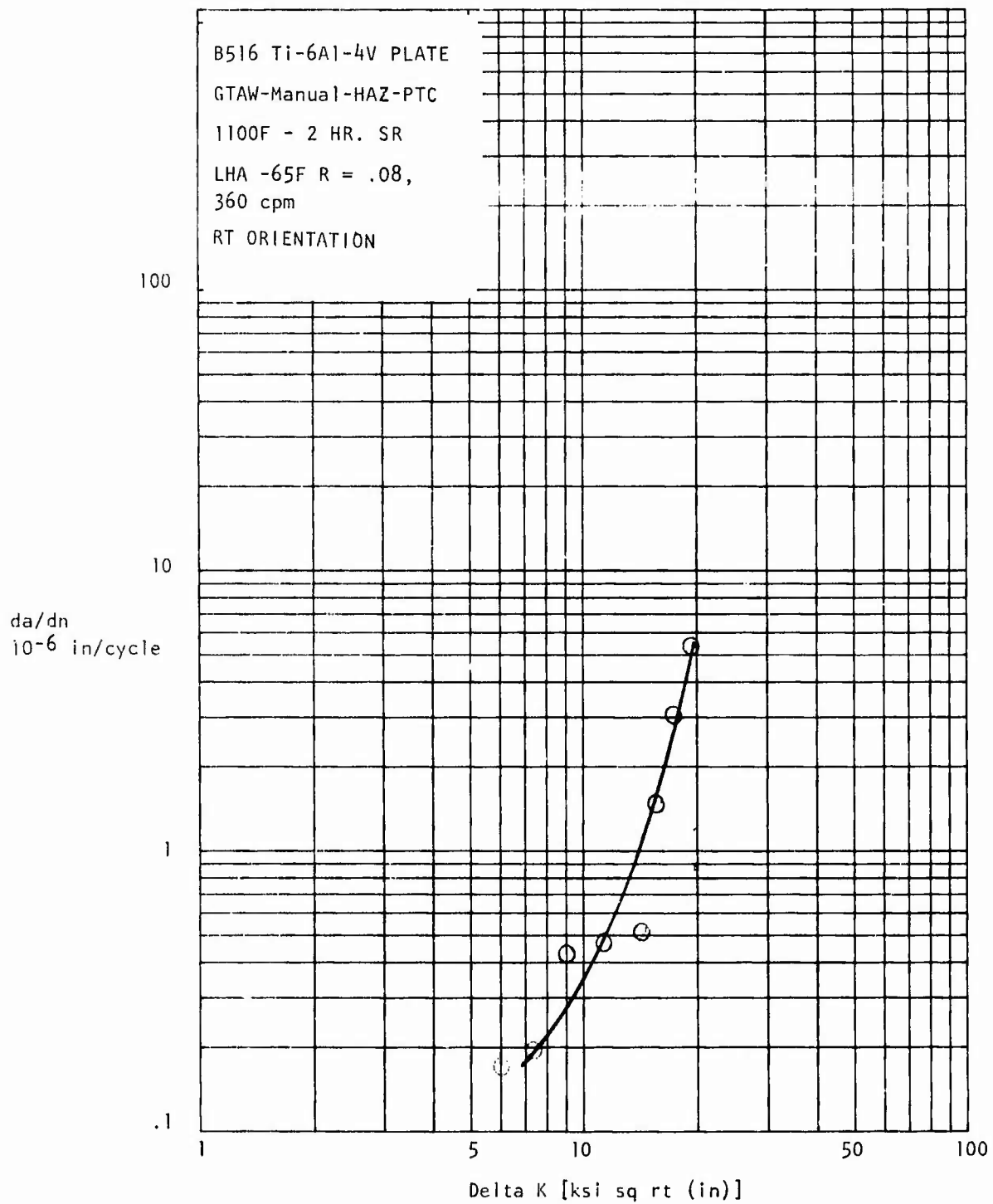


Figure 75 NRT B516

Fatigue Crack Growth Rate in the HAZ of a Welded
Ti-6Al-4V Plate PTC Specimen in LHA at -65F

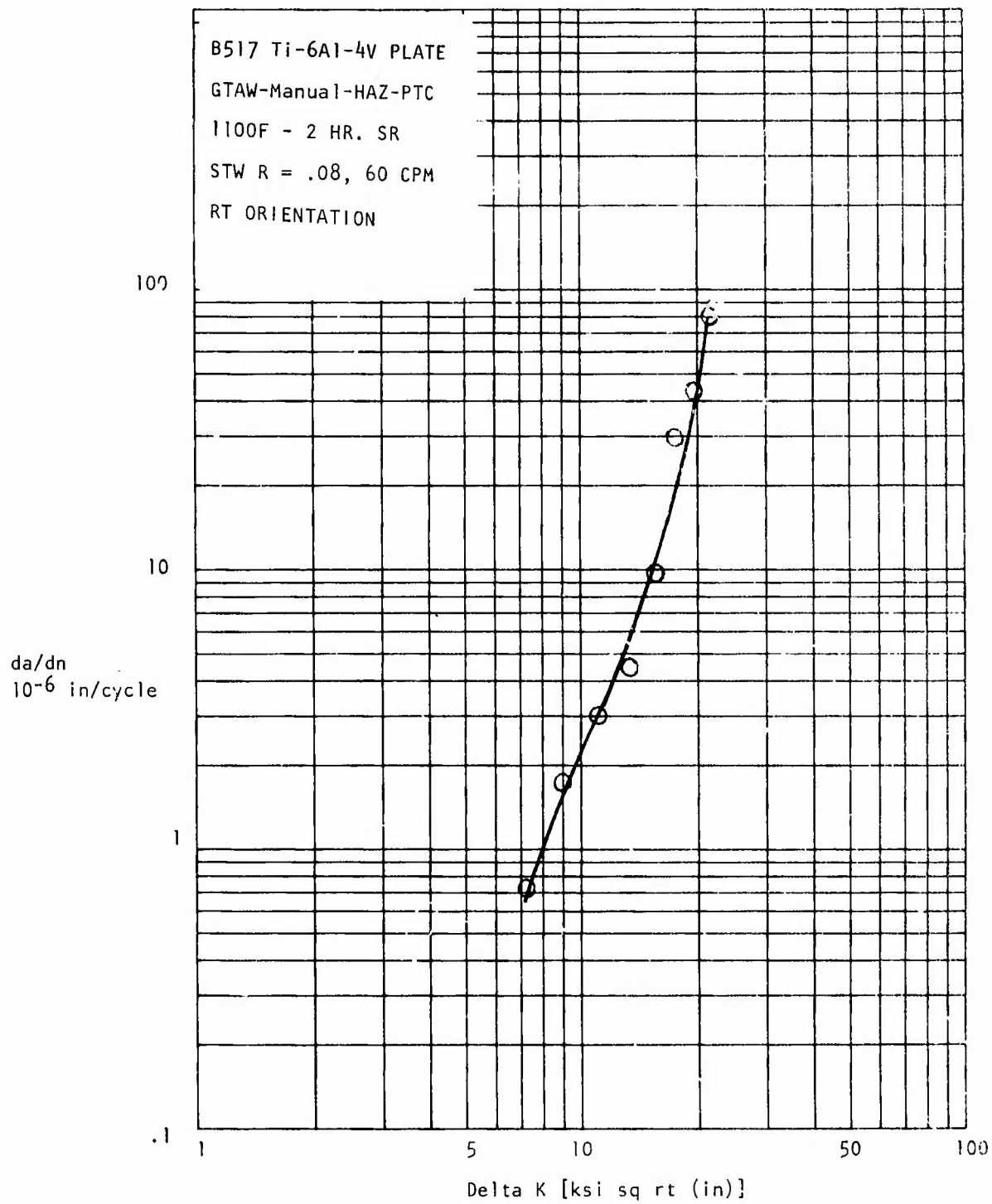


Figure 75 NRT B517

Fatigue Crack Growth Rate in the HAZ of a Welded
Ti-6Al-4V Plate PTC Specimen in STW

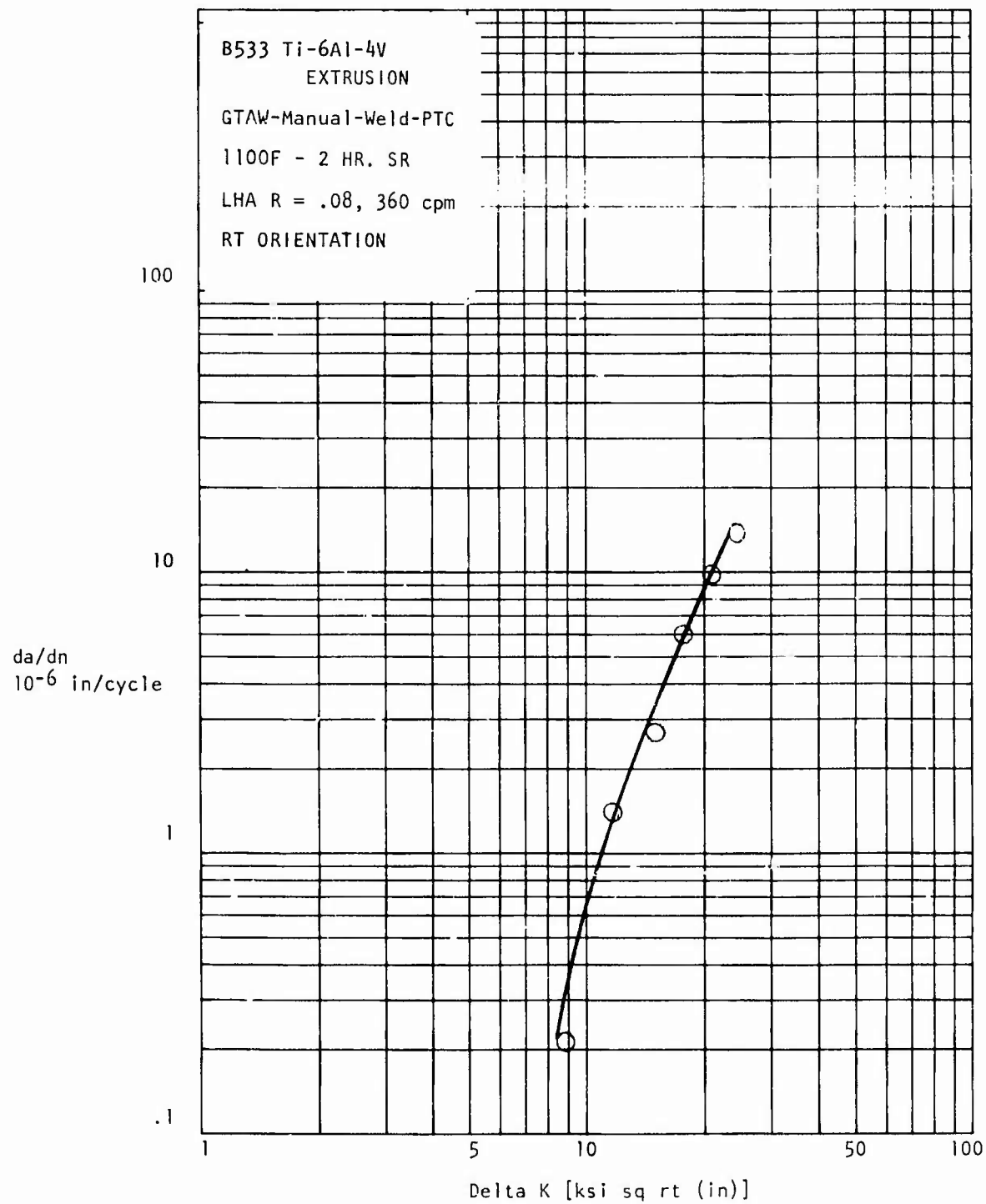


Figure 75 NRT B533 Fatigue Crack Growth Rate in the Weld Metal of a Welded Ti-6Al-4V Extrusion PTC Specimen

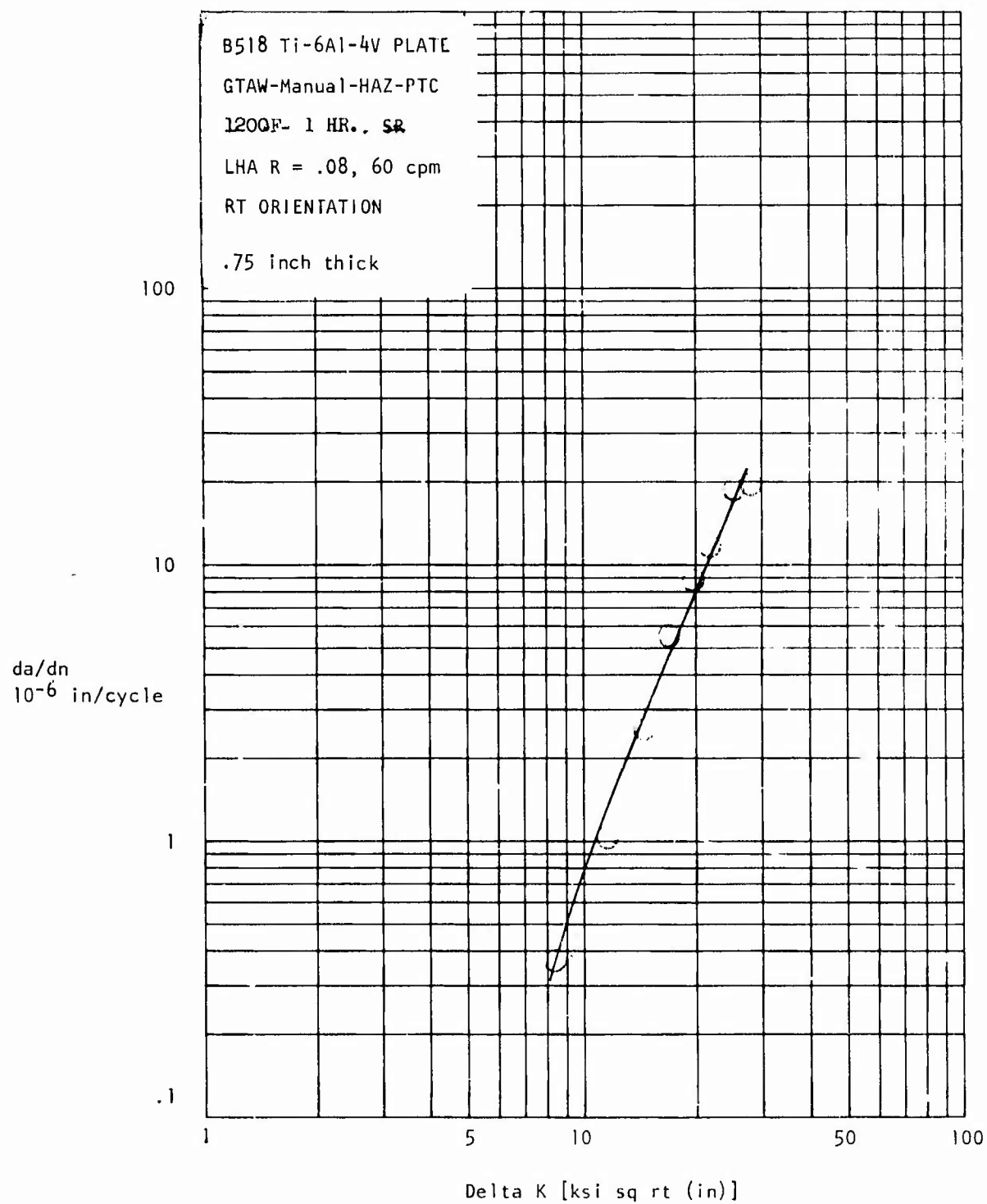


Figure 76 NRT B518

Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

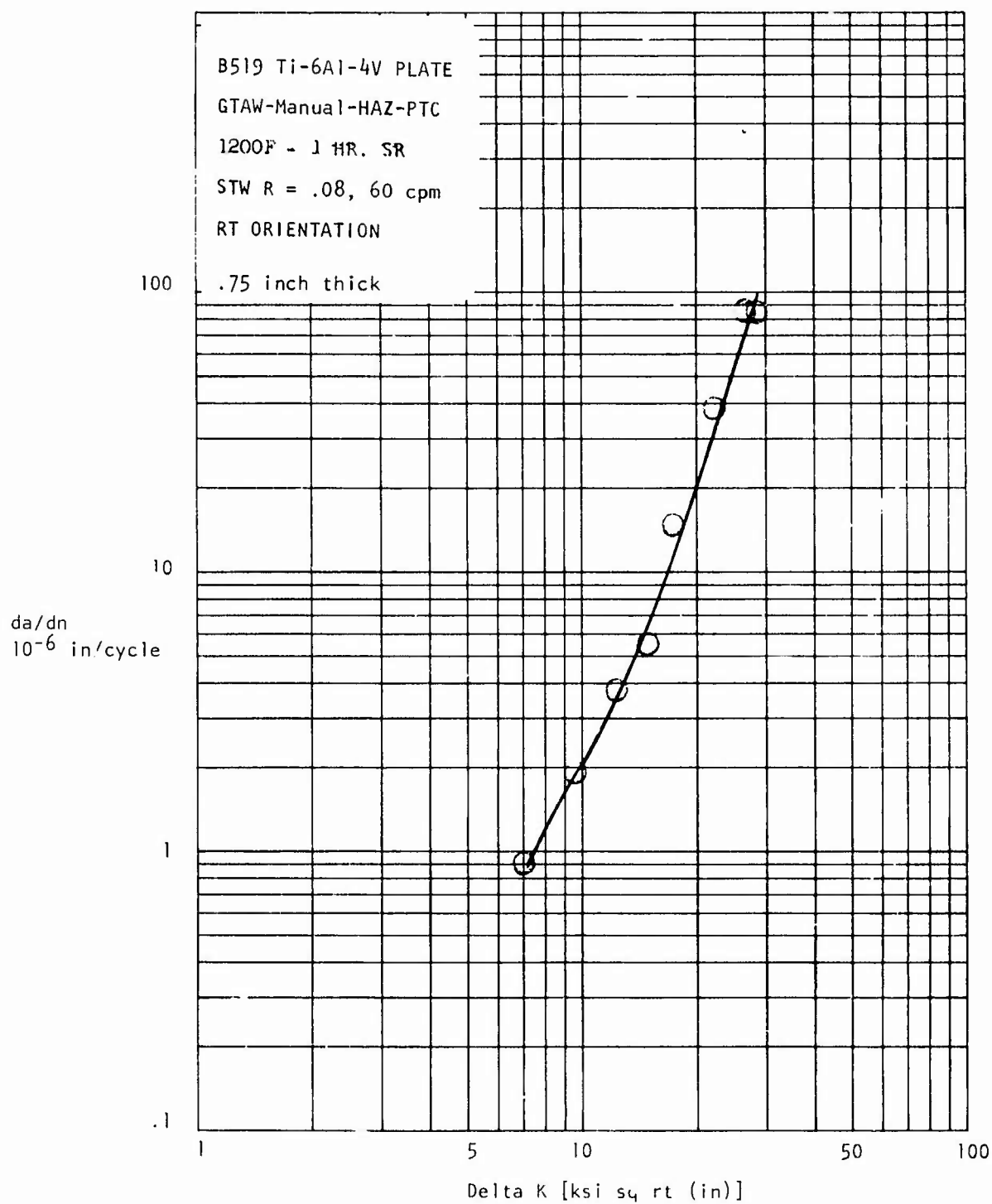


Figure 76 NRT B519 Fatigue Crack Growth Rate in the HAZ of a Welded
 Ti-6Al-4V Plate PTC Specimen in STW

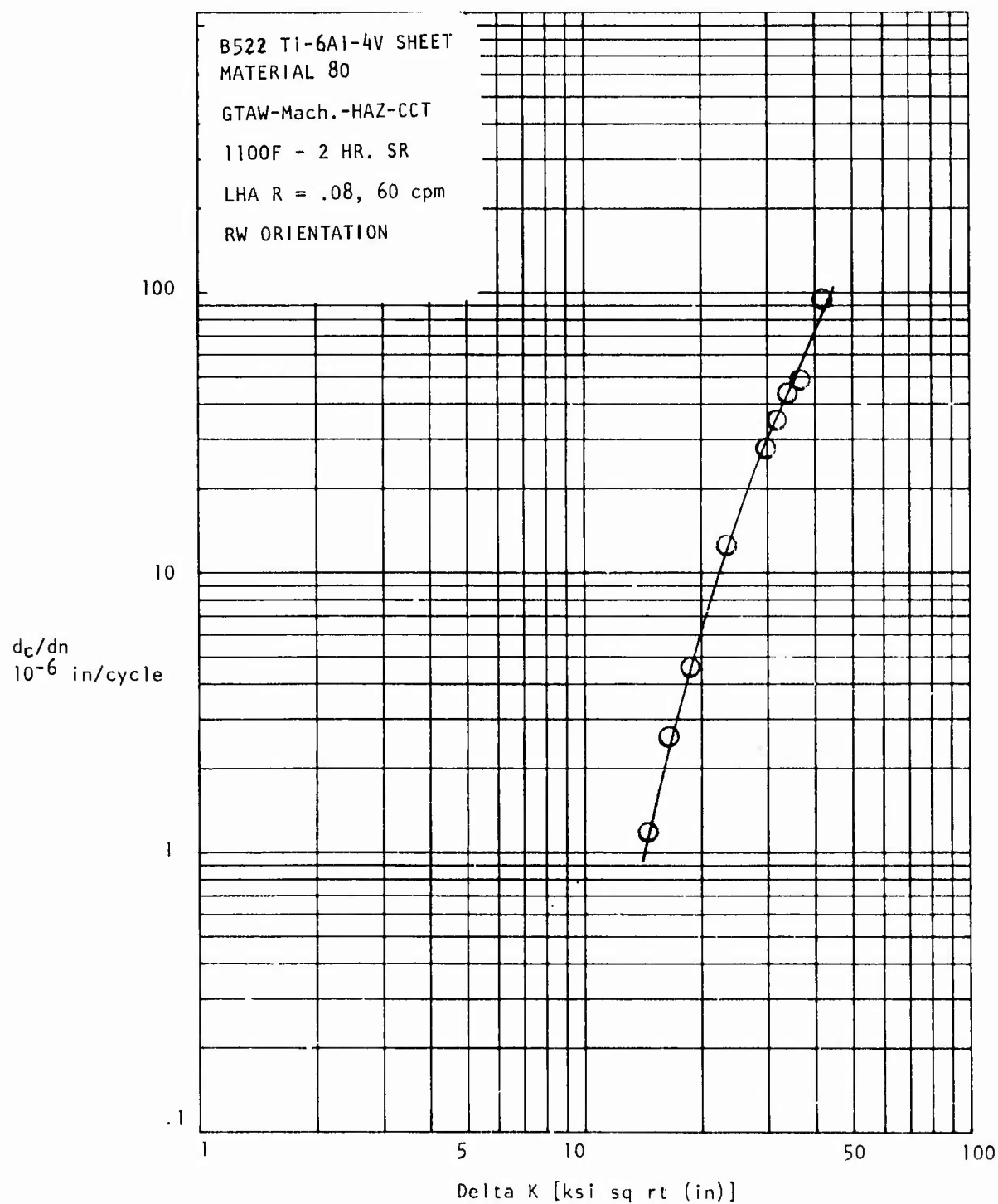


Figure 80 NRW B522

Fatigue Crack Growth Rate in the HAZ of a Welded
Ti-6Al-4V Sheet CCT Specimen in LHA

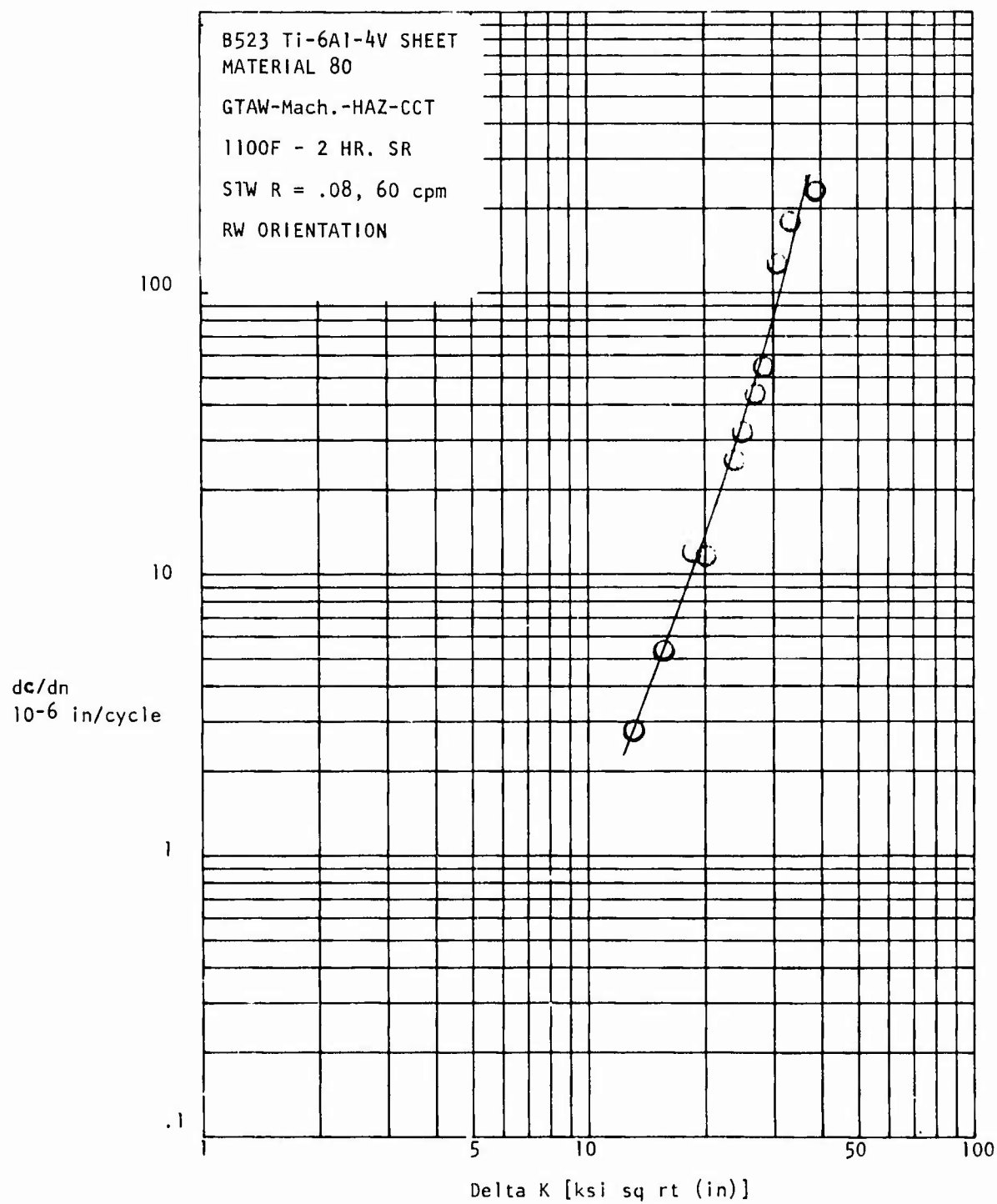


Figure 80 NRW B523

Fatigue Crack Growth Rate in the HAZ of a Welded
Ti-6Al-4V Sheet CLT Specimen in STW

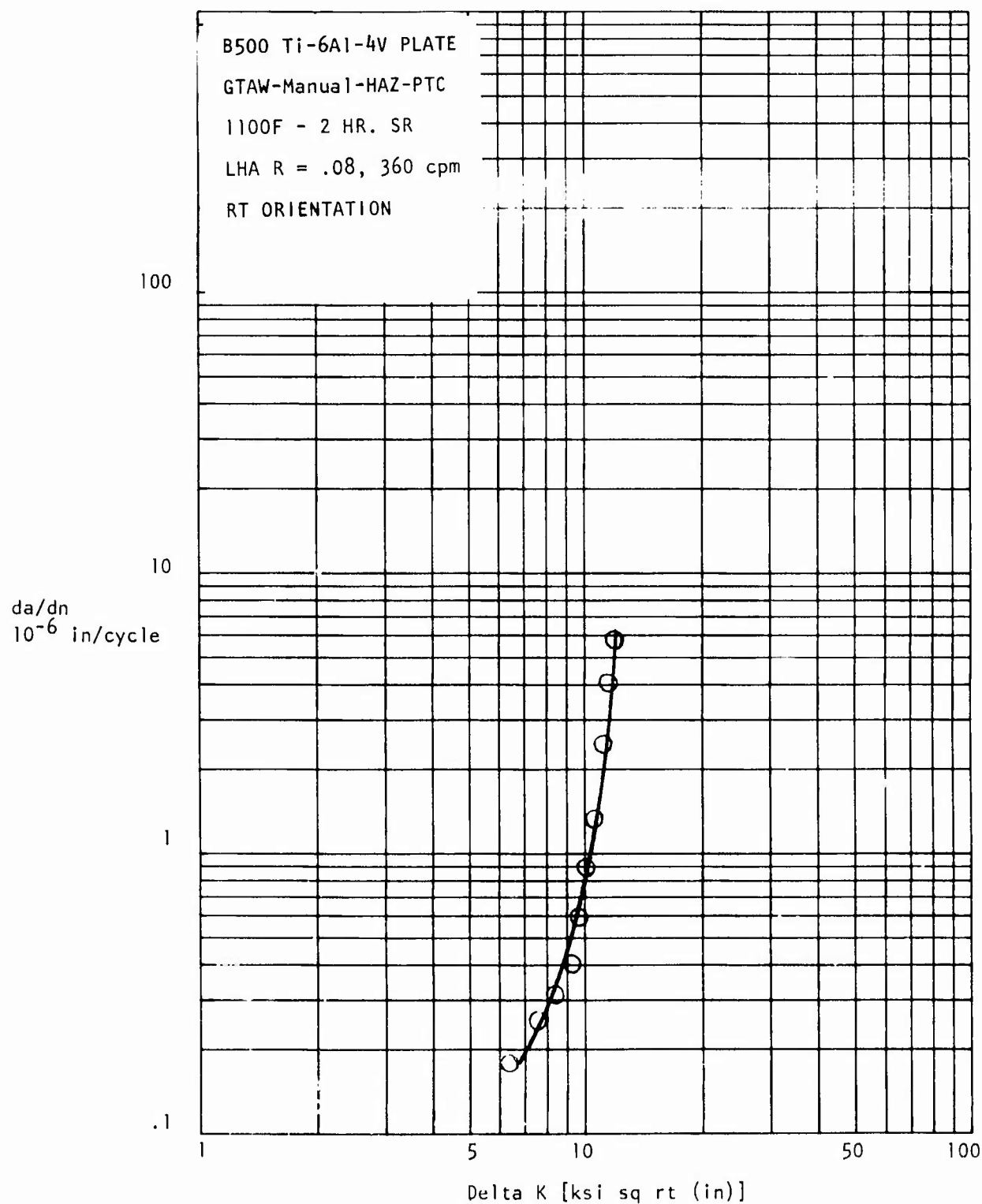


Figure 87 NRT B500

Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA.

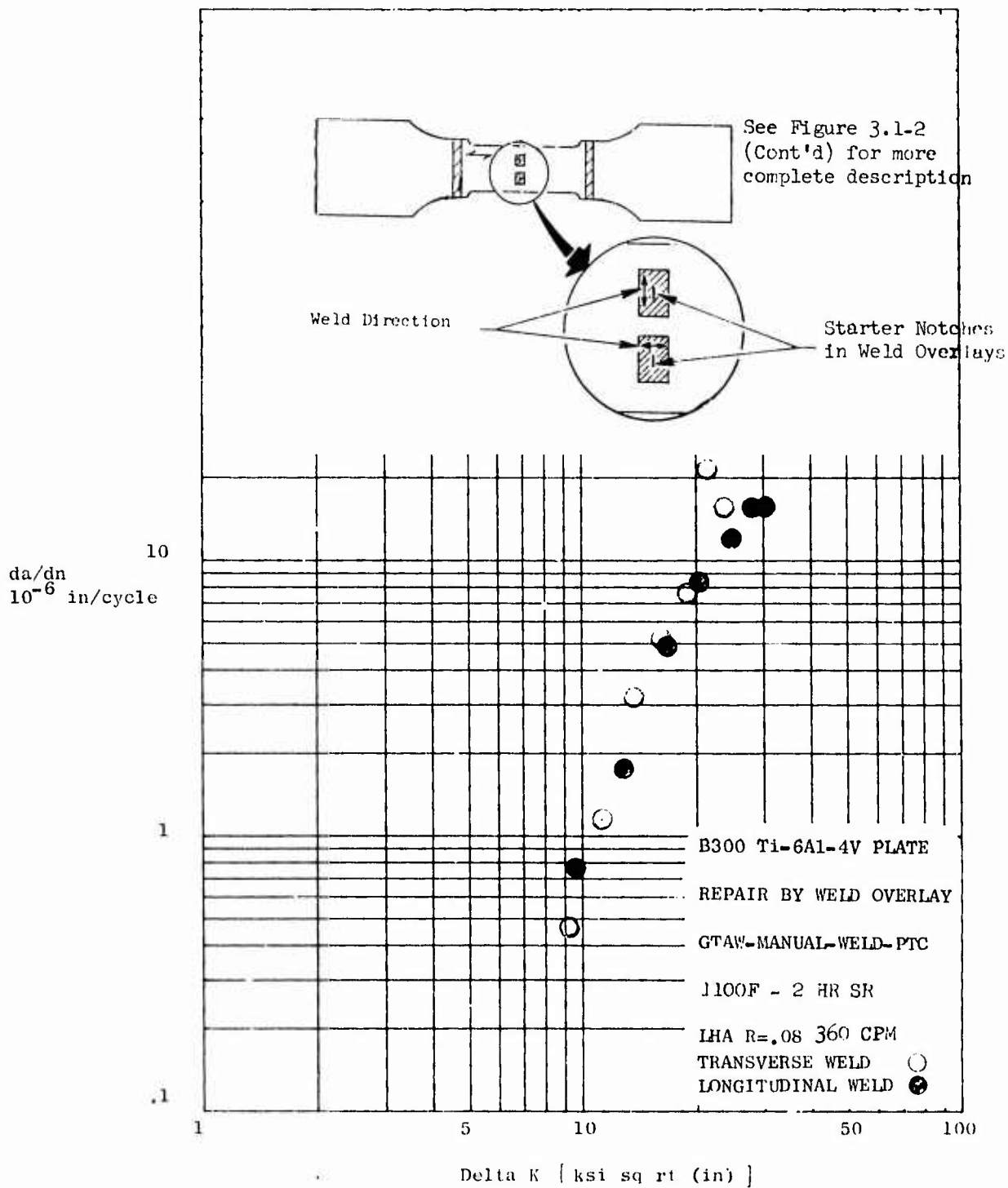


Figure 88 NRT B300

Fatigue Crack Growth Rate in a Special Overlay Repair
Weld Specimen with Two Flaws (Stress Relieved
Ti-6Al-4V Plate-PTC Specimen).

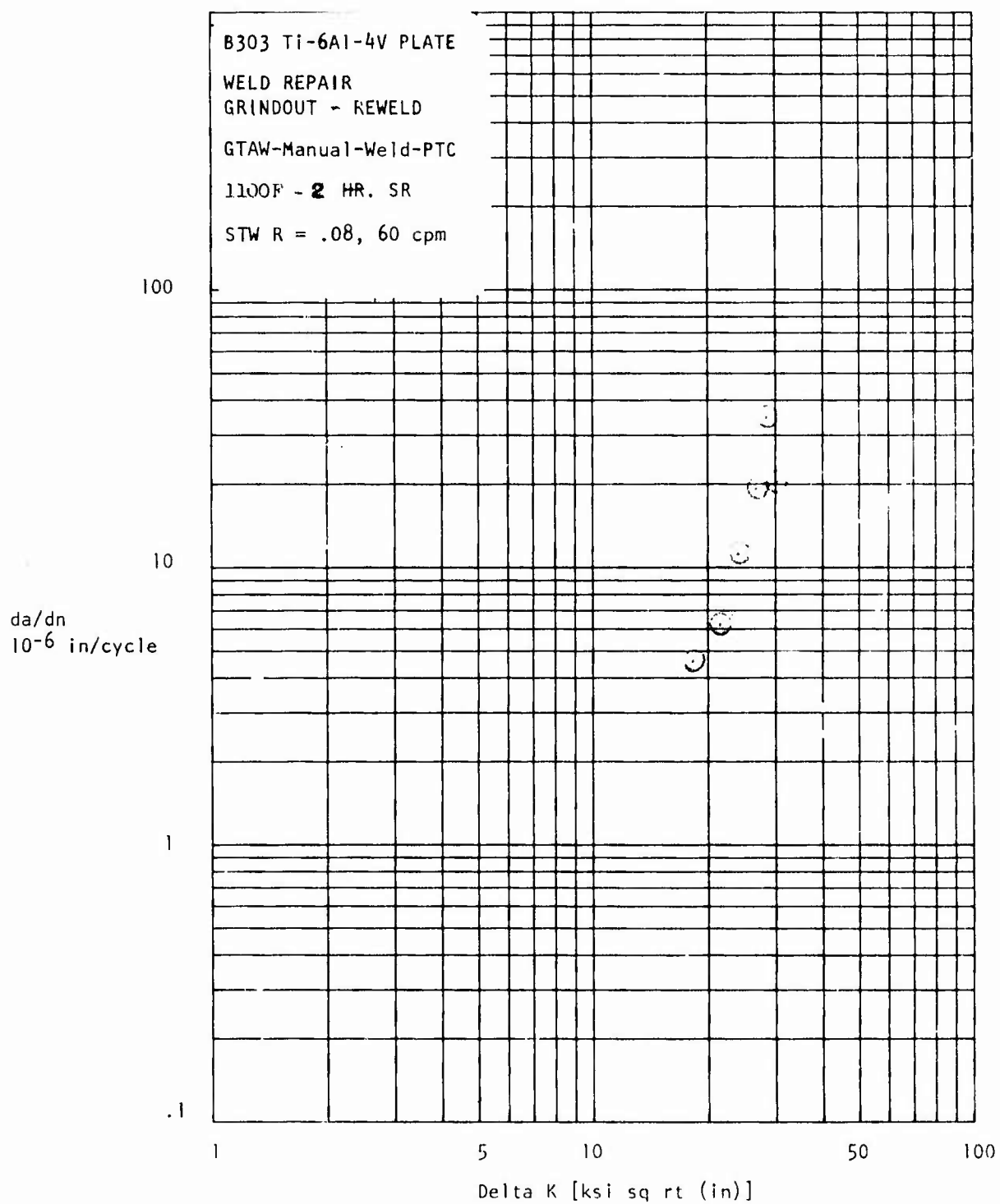


Figure 38 NRT B303

Fatigue Crack Growth Rate in the Weld of a Rewelded and Stress Relieved Ti-6Al-4V Plate PTC Specimen

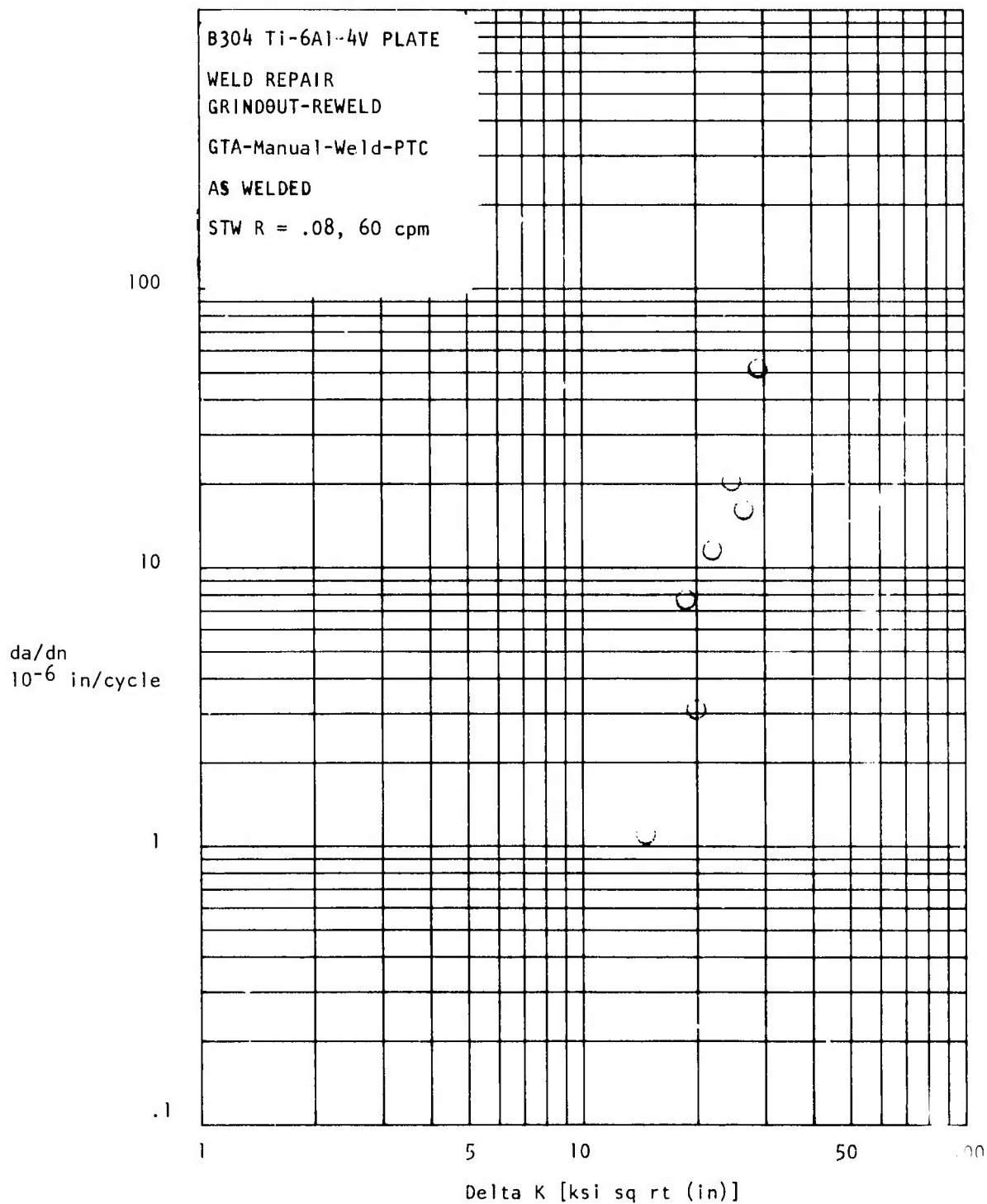


Figure 88 NRT B304

Fatigue Crack Growth Rate in the Weld of a Rewelded Ti-6Al-4V Plate PTC Specimen with no Stress Relief

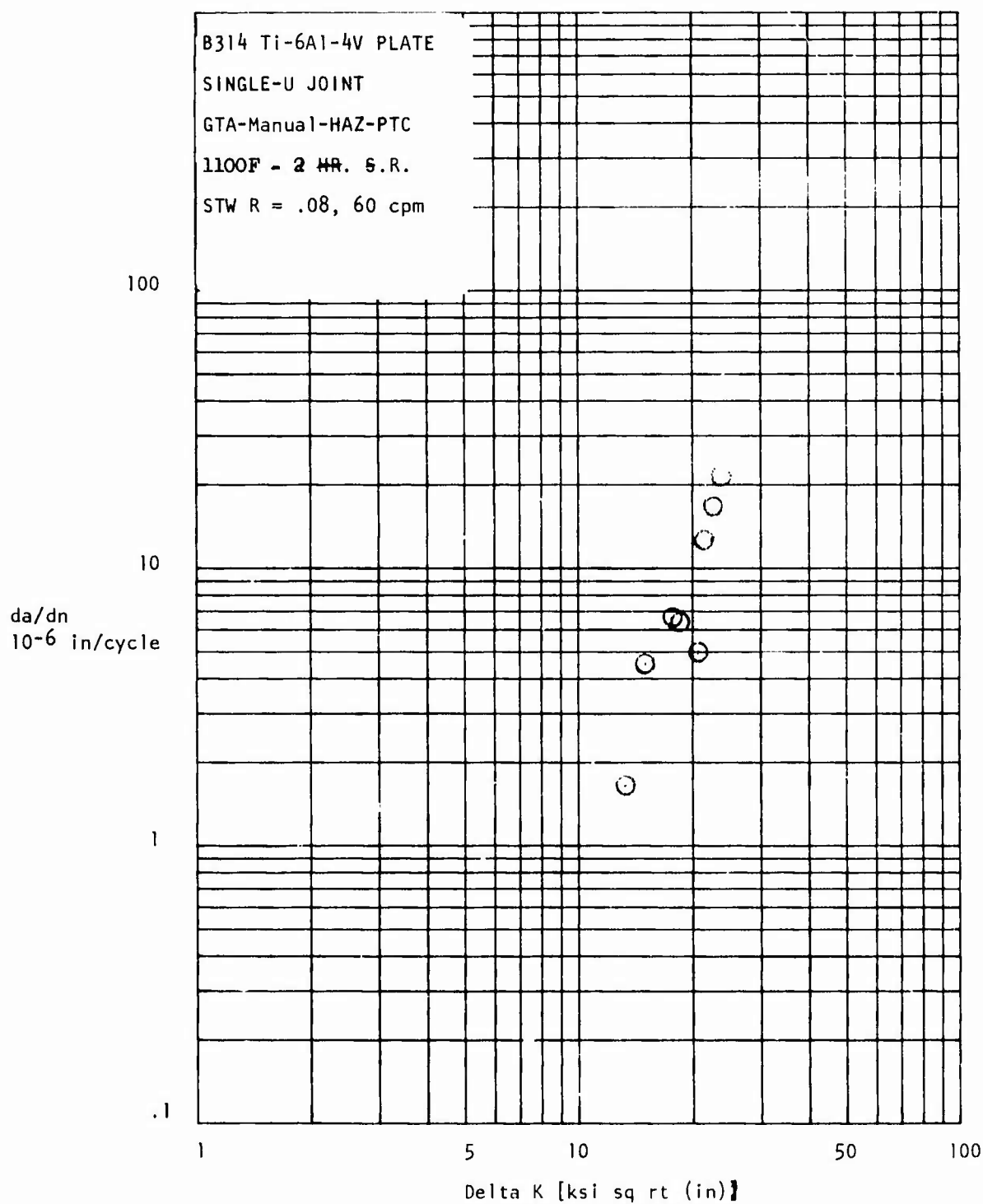


Figure 88 NRT B314

Fatigue Crack Growth Rate in the HAZ of a Welded and Stress Relieved Single-U Joint in a Ti-6Al-4V Plate PTC Specimen

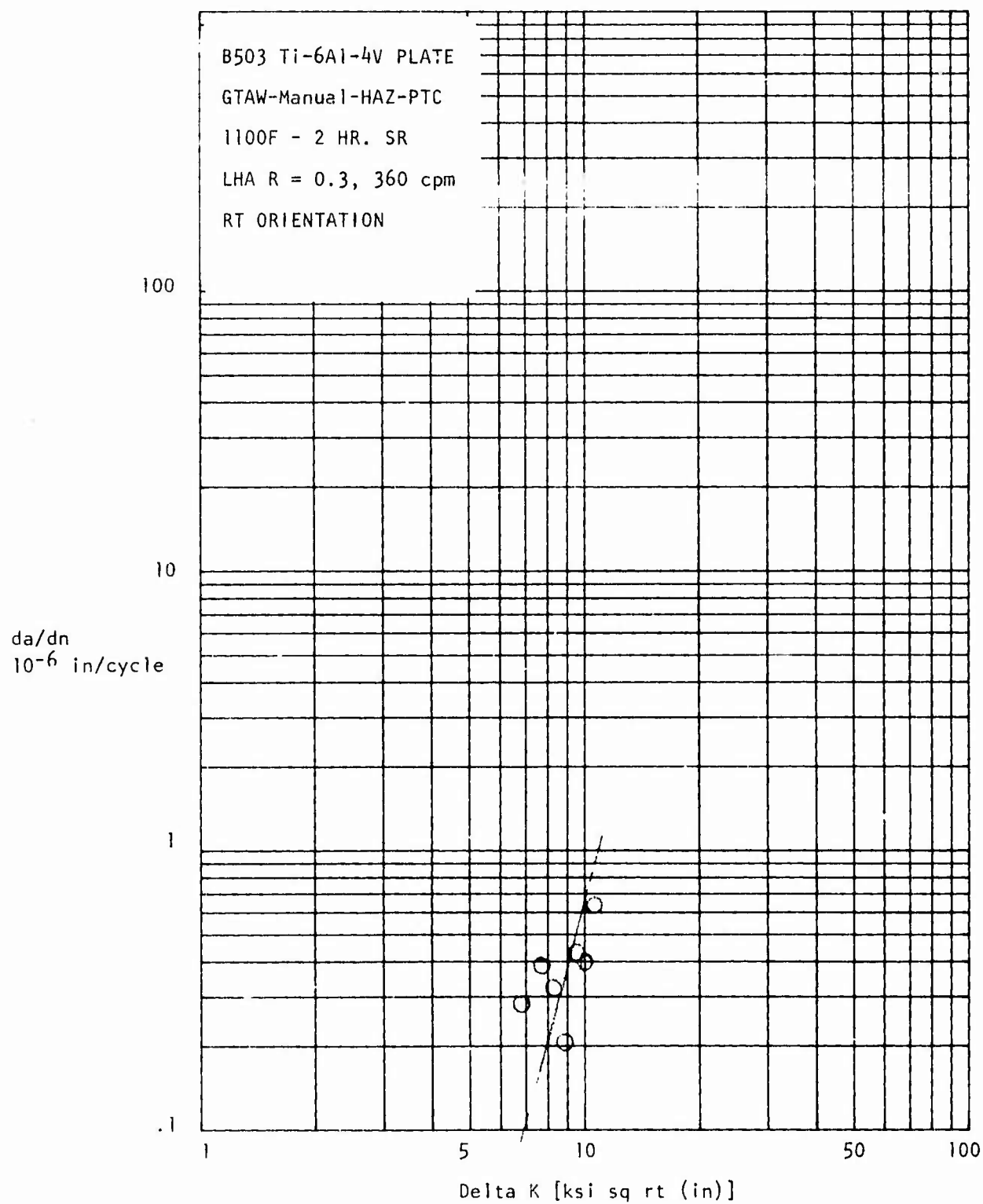


Figure 88 NRT B503

Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

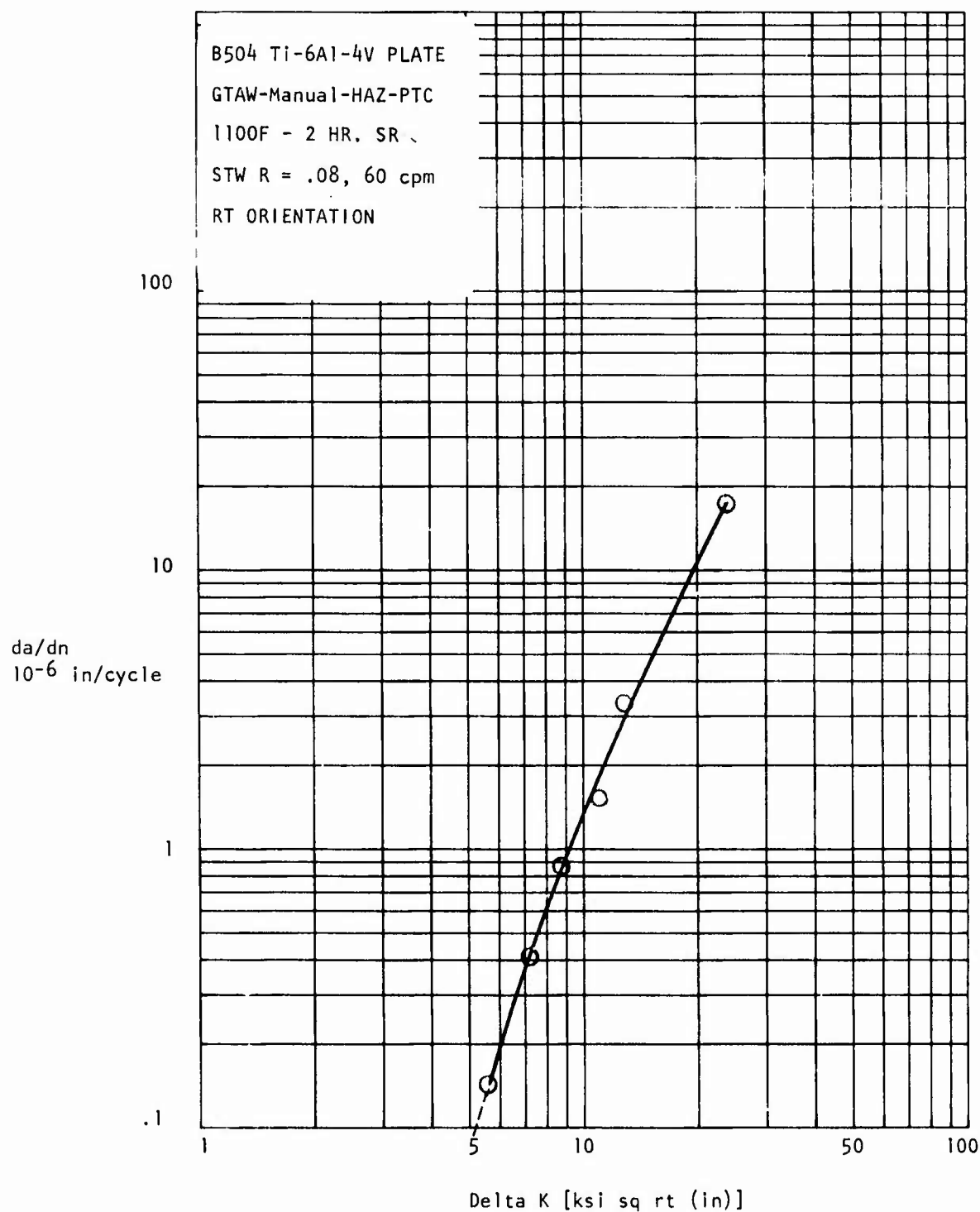


Figure 88 NRT B504

Fatigue Crack Growth Rate in the HAZ of a Welded
Ti-6Al-4V Plate PTC Specimen in STW

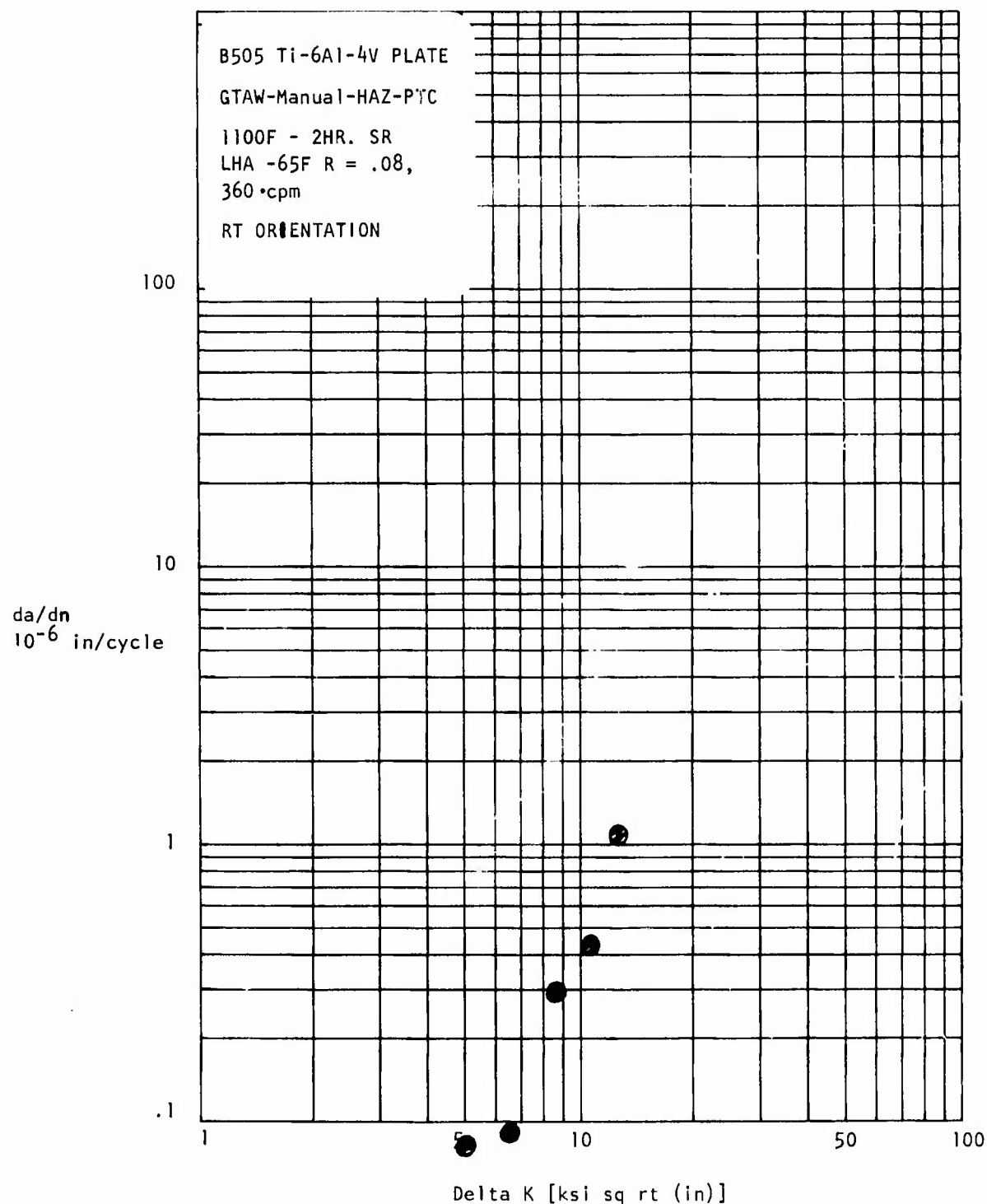


Figure 88 NRT B505

Fatigue Crack Growth Rate in the HAZ of a Welded
Ti-6Al-4V Plate PTC Specimen in LHA at -65F

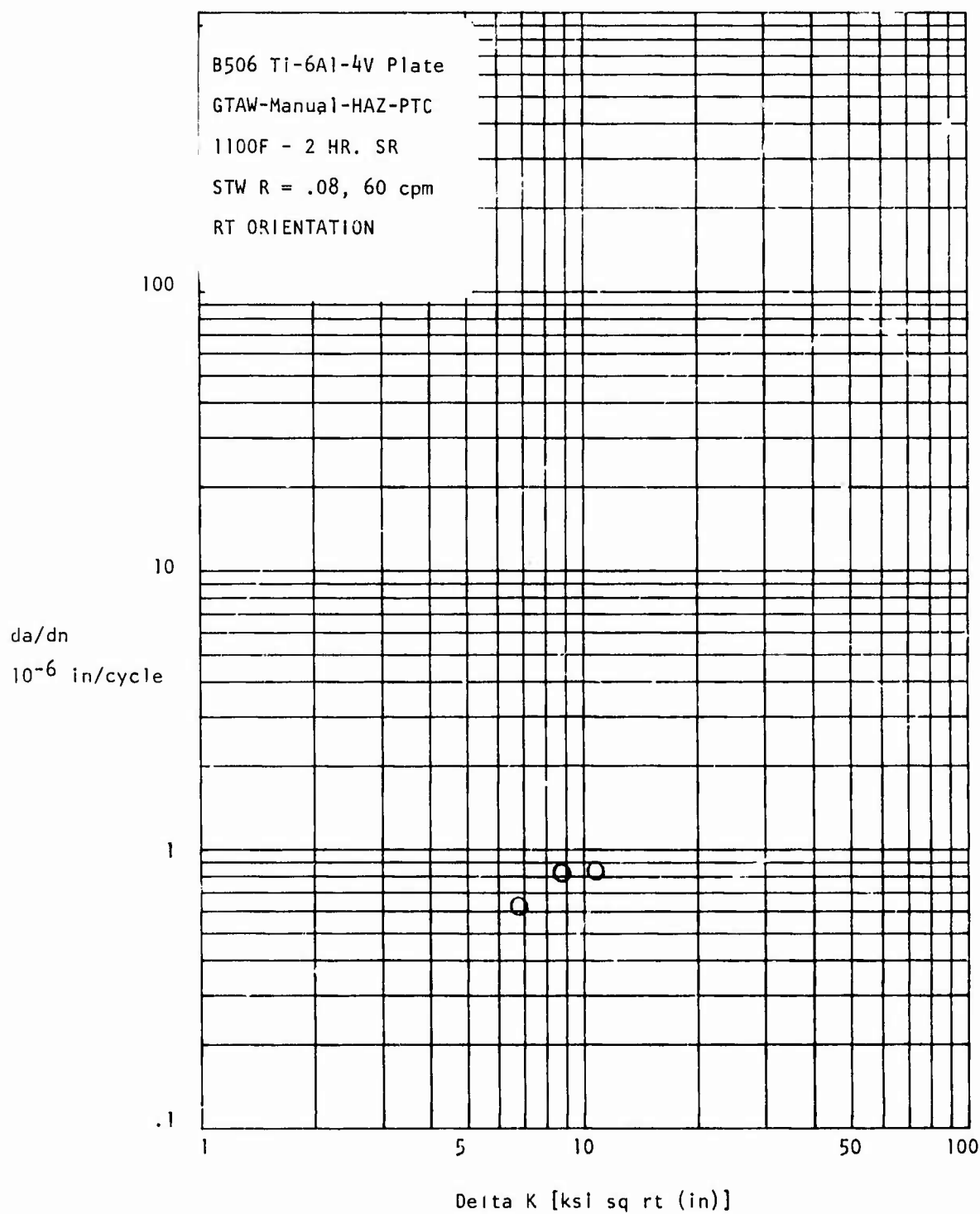


Figure 88 NRT B506

Fatigue Crack Growth Rate in the HAZ of a Welded
Ti-6Al-4V Plate PTC Specimen in STW

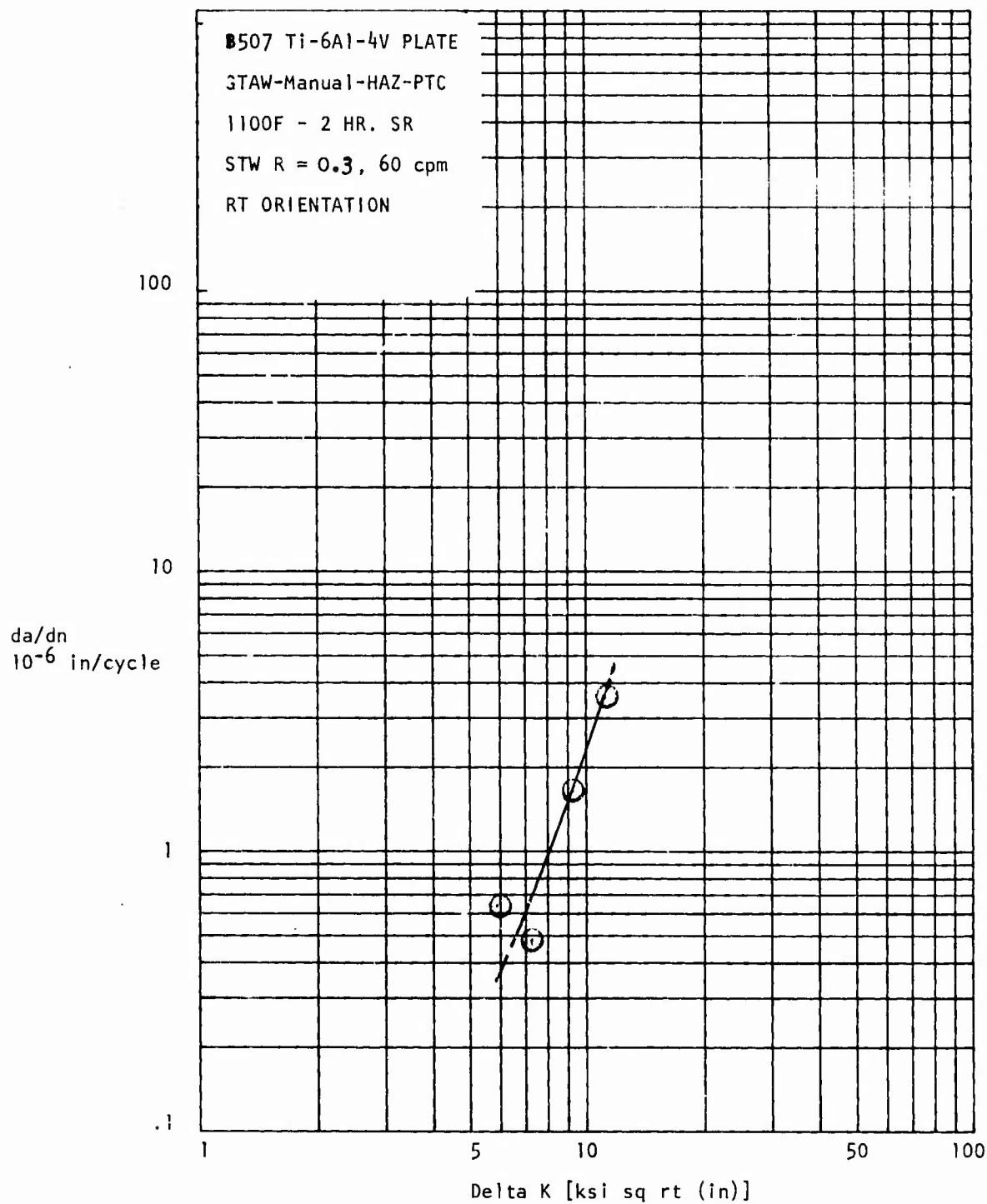


Figure 88 NRT B507

Fatigue Crack Growth Rate in the HAZ of a welded Ti-6Al-4V Plate PTC Specimen in STW

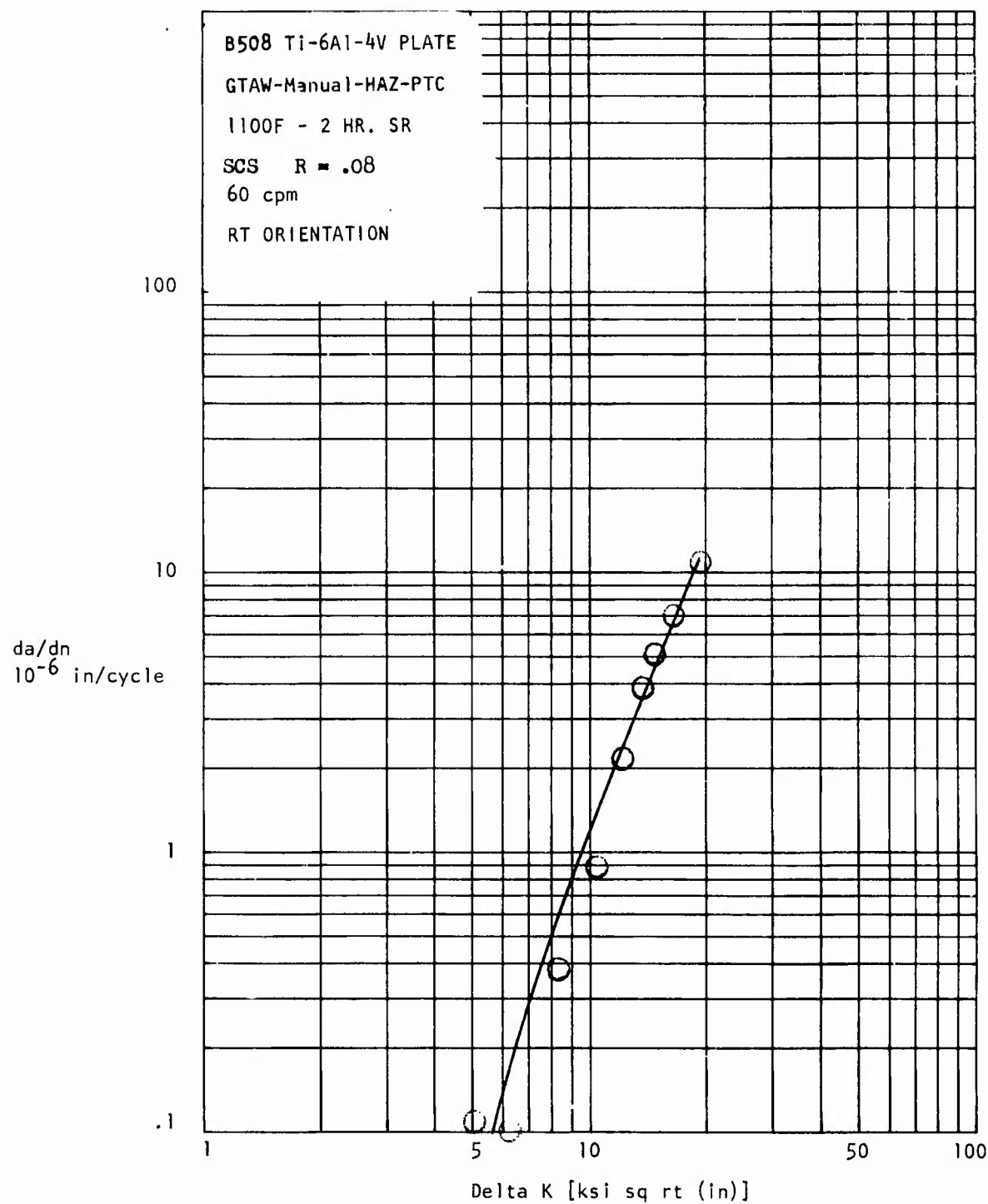


Figure 88 NRT B508

Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in SCS.

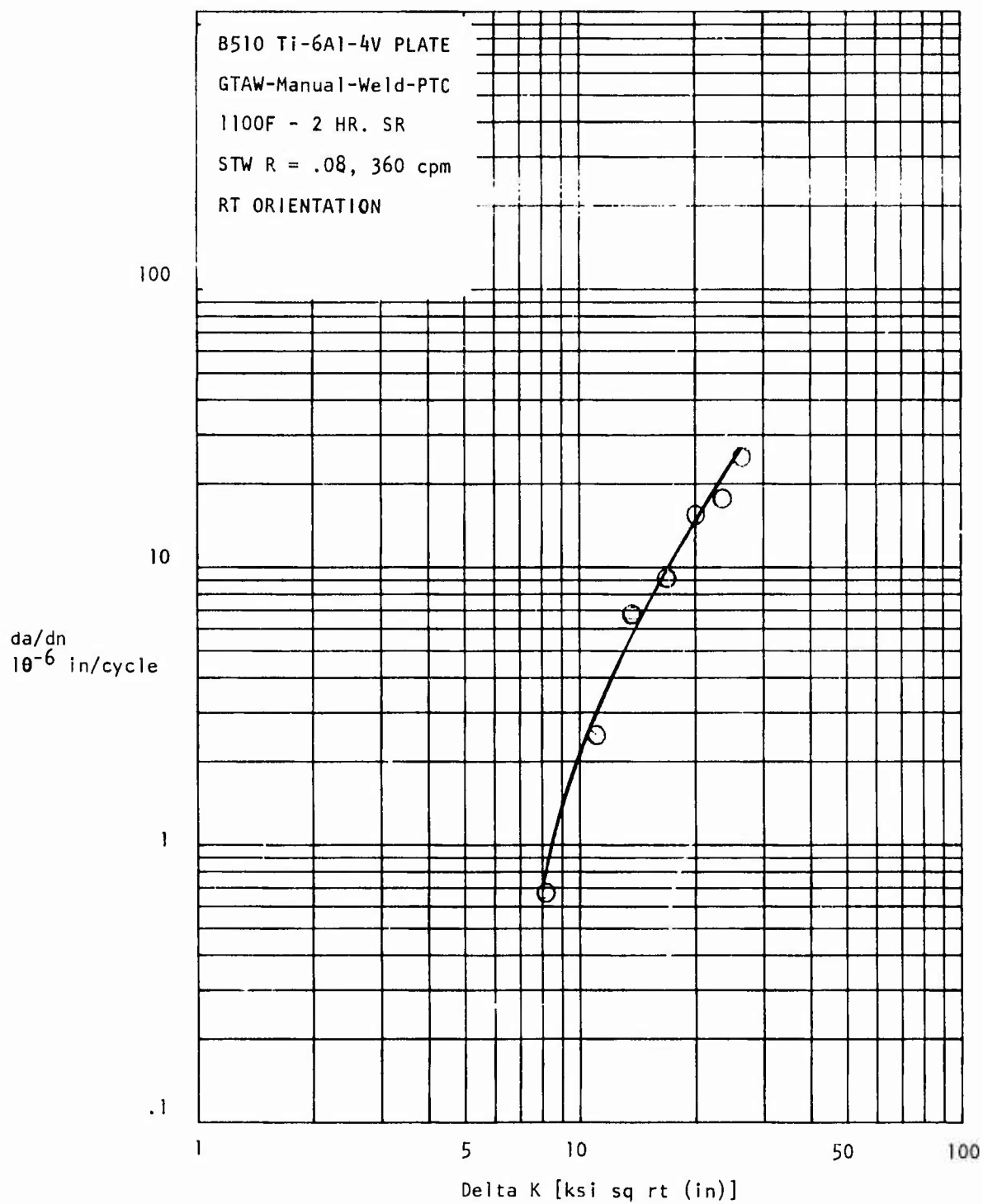


Figure 88 NRT B510

Fatigue Crack Growth Rate in the Weld Metal of Welded Ti-6Al-4V Plate PTC Specimen in STW

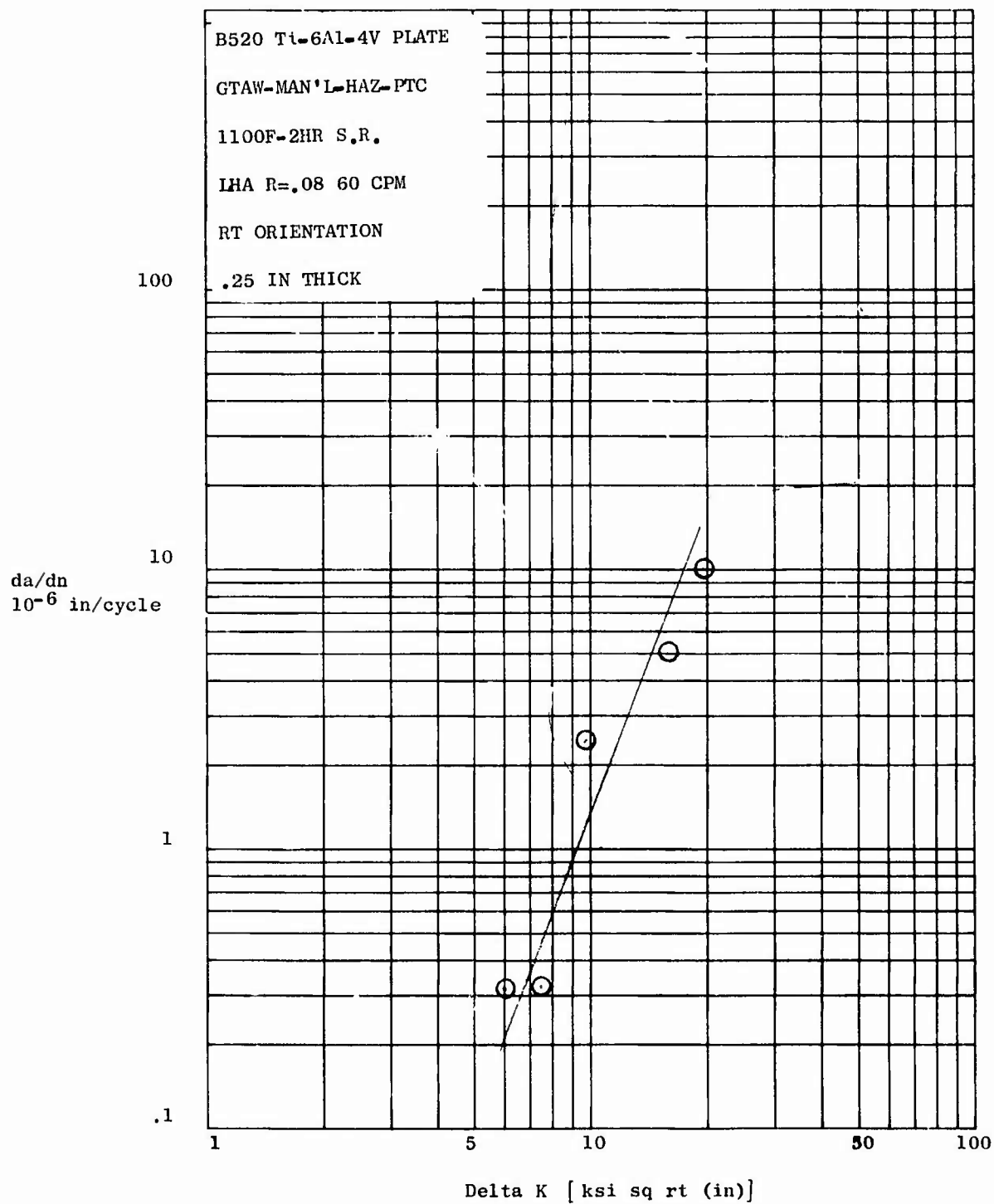


Figure 88 NRT B520

Fatigue Crack Growth Rate in the HAZ of a Welded
.25 in. Thick Ti-6Al-4V Plate PTC Specimen.

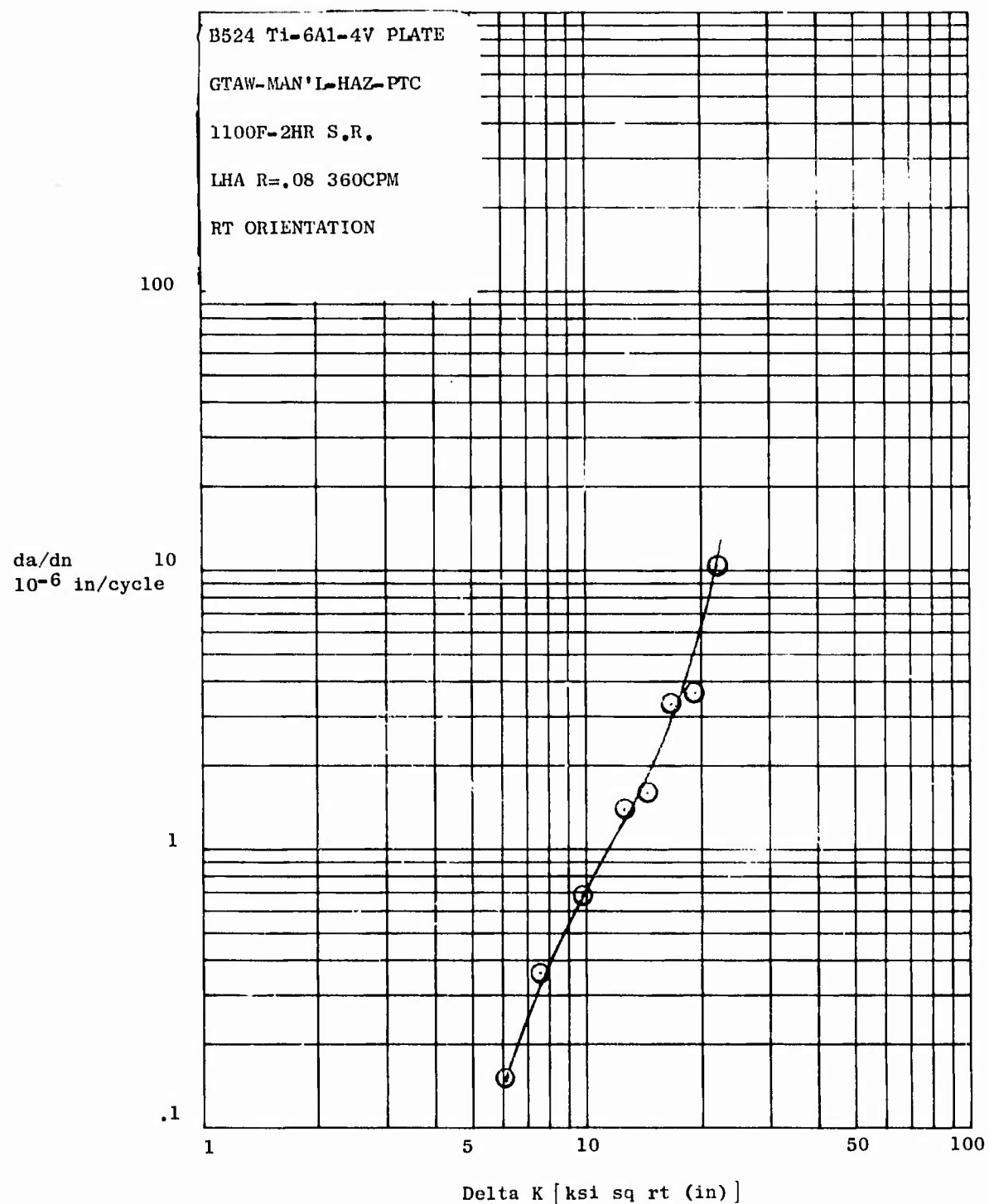


Figure 88 NRT B524

Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen.

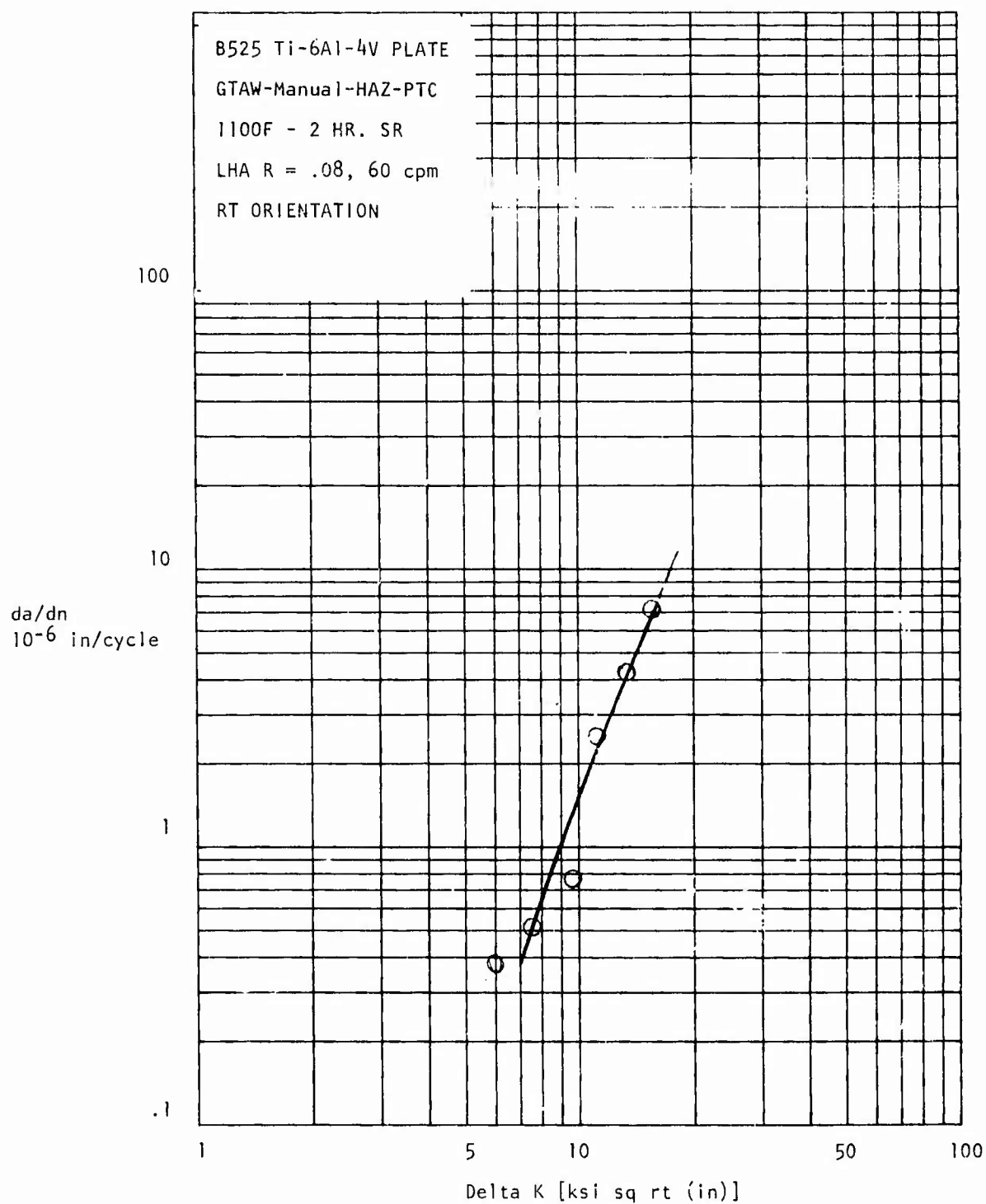


Figure 88 NRT B525

Fatigue Crack Growth Rate in the HAZ of a Welded
Ti-6Al-4V Plate PTC Specimen in LHA

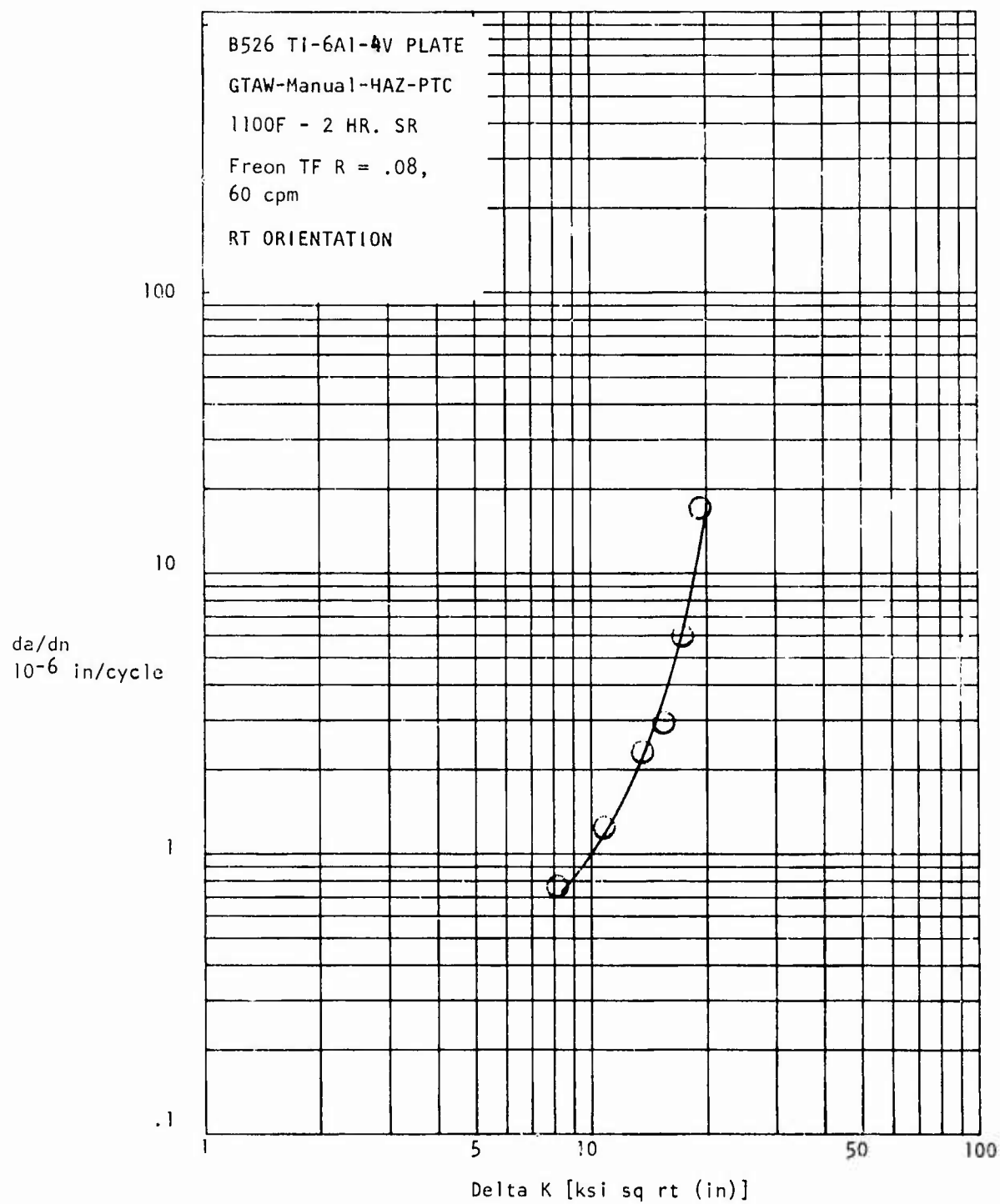


Figure 83 NRT B526

Fatigue Crack Growth Rate in the HAZ of a Welded
Ti-6Al-4V Plate PTC Specimen in Freon TF

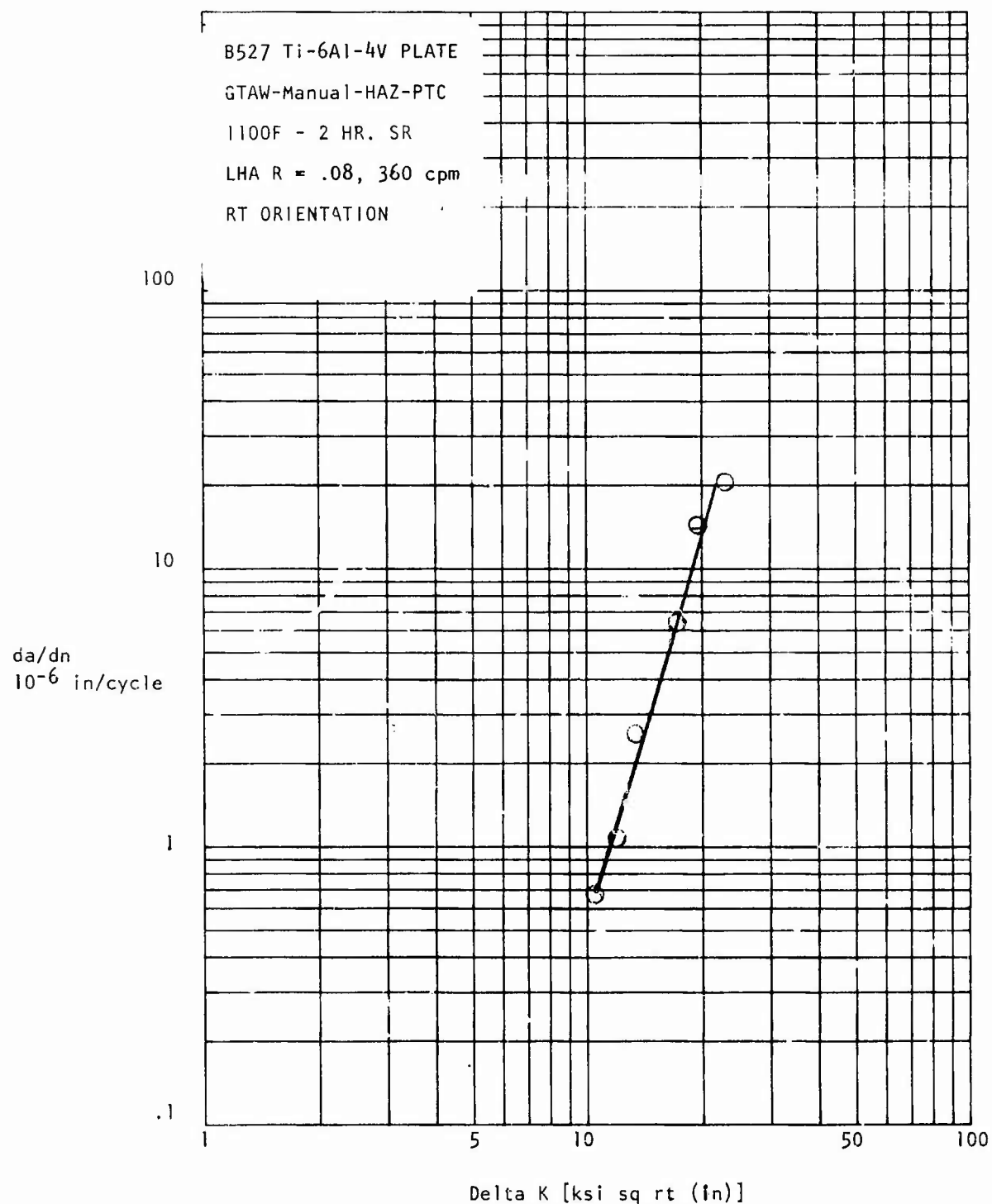


Figure 88 NRT B527

Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

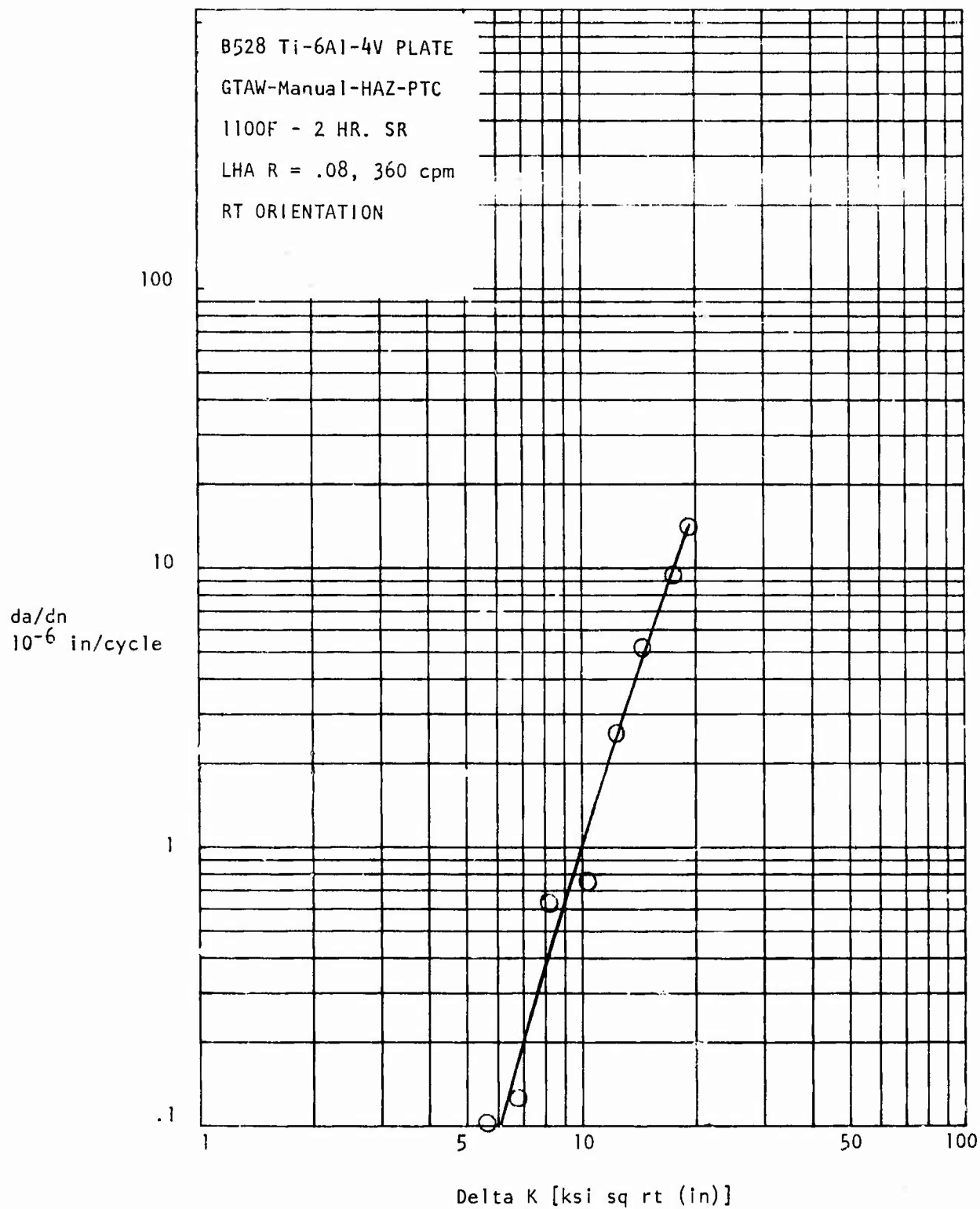


Figure 88 NRT B528

Fatigue Crack Growth Rate in the HAZ of a Welded
Ti-6Al-4V Plate PTC Specimen in LHA

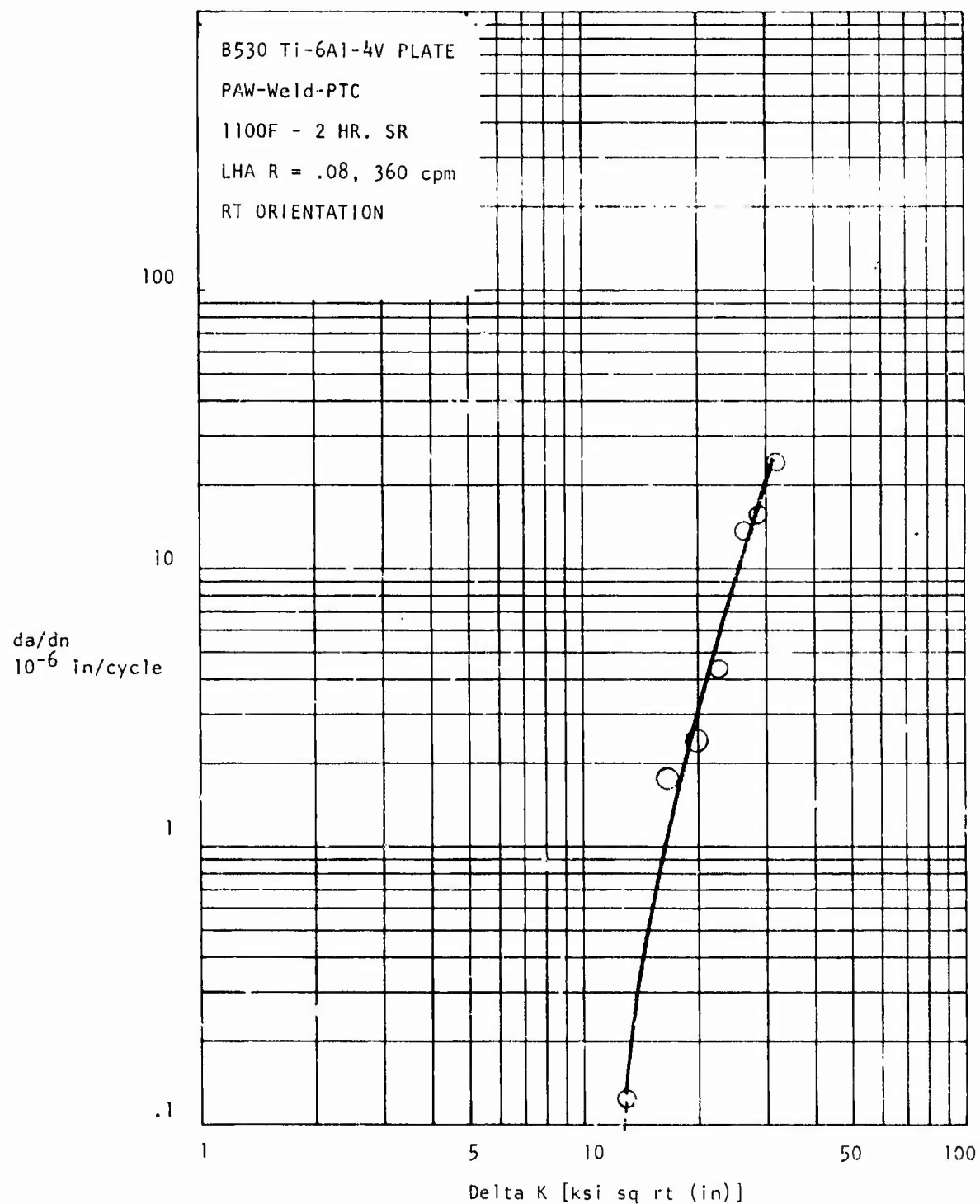


Figure 88 NRT B530

Fatigue Crack Growth Rate in the Weld Metal of a
PAW Welded Ti-6Al-4V Plate PTC Specimen in LHA

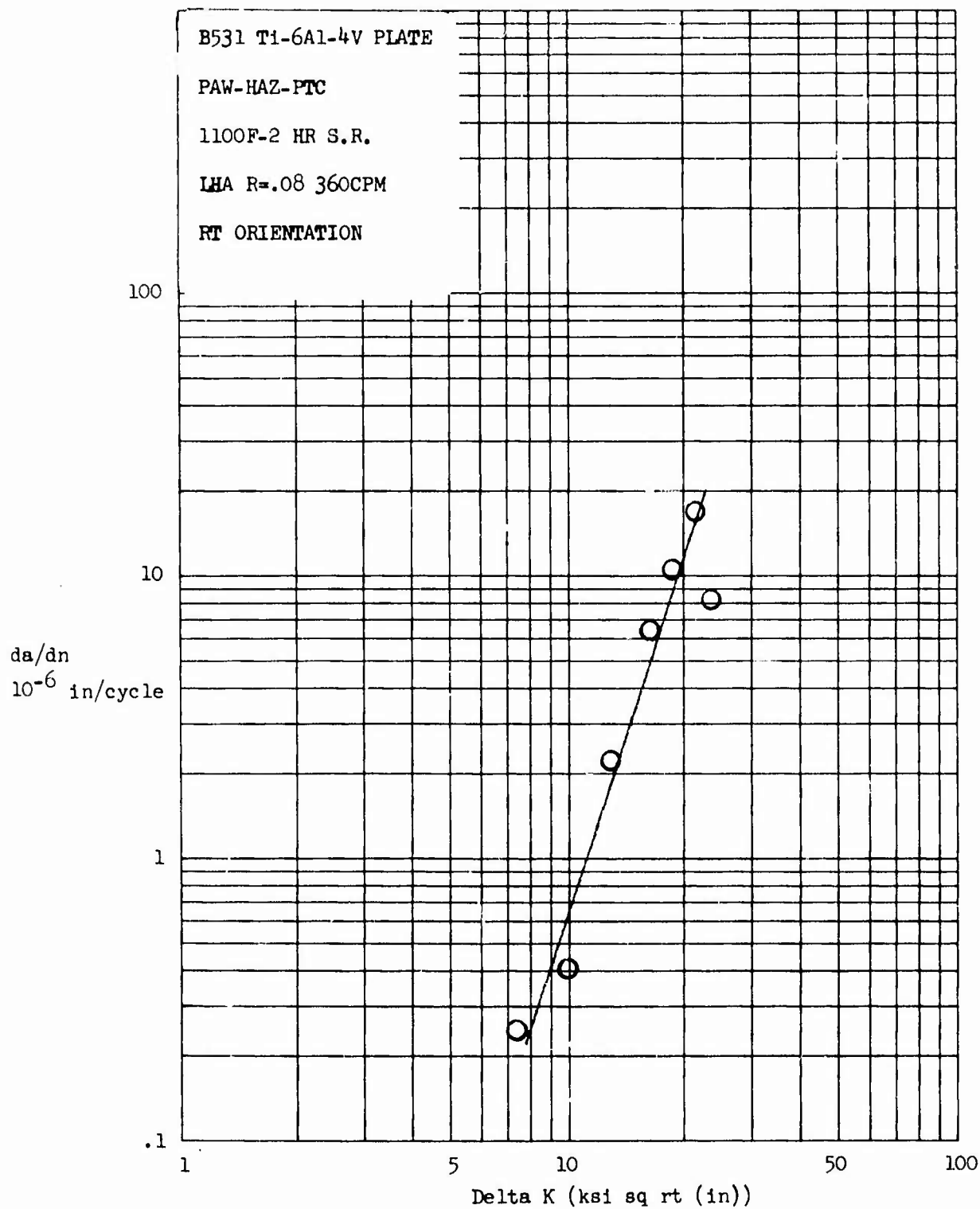


Figure 88 NRT B531

Fatigue Crack Growth Rate in the HAZ
of a PAW Welded Ti-6Al-4V Plate PTC
Specimen in LHA

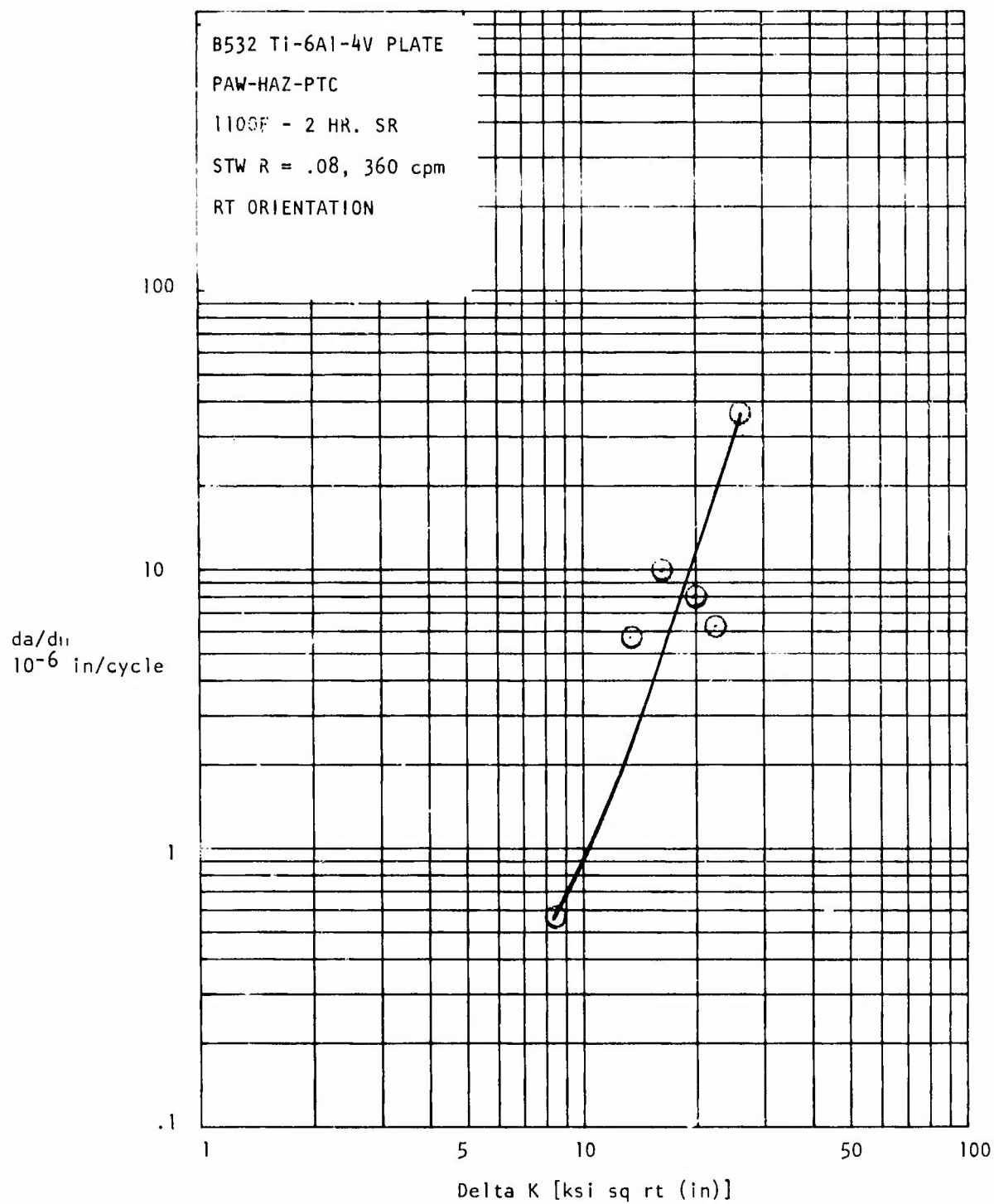


Figure 88 NRT B532

Fatigue Crack Growth Rate in the HAZ of a PAW Welded Ti-6Al-4V Plate PTC Specimen in STW

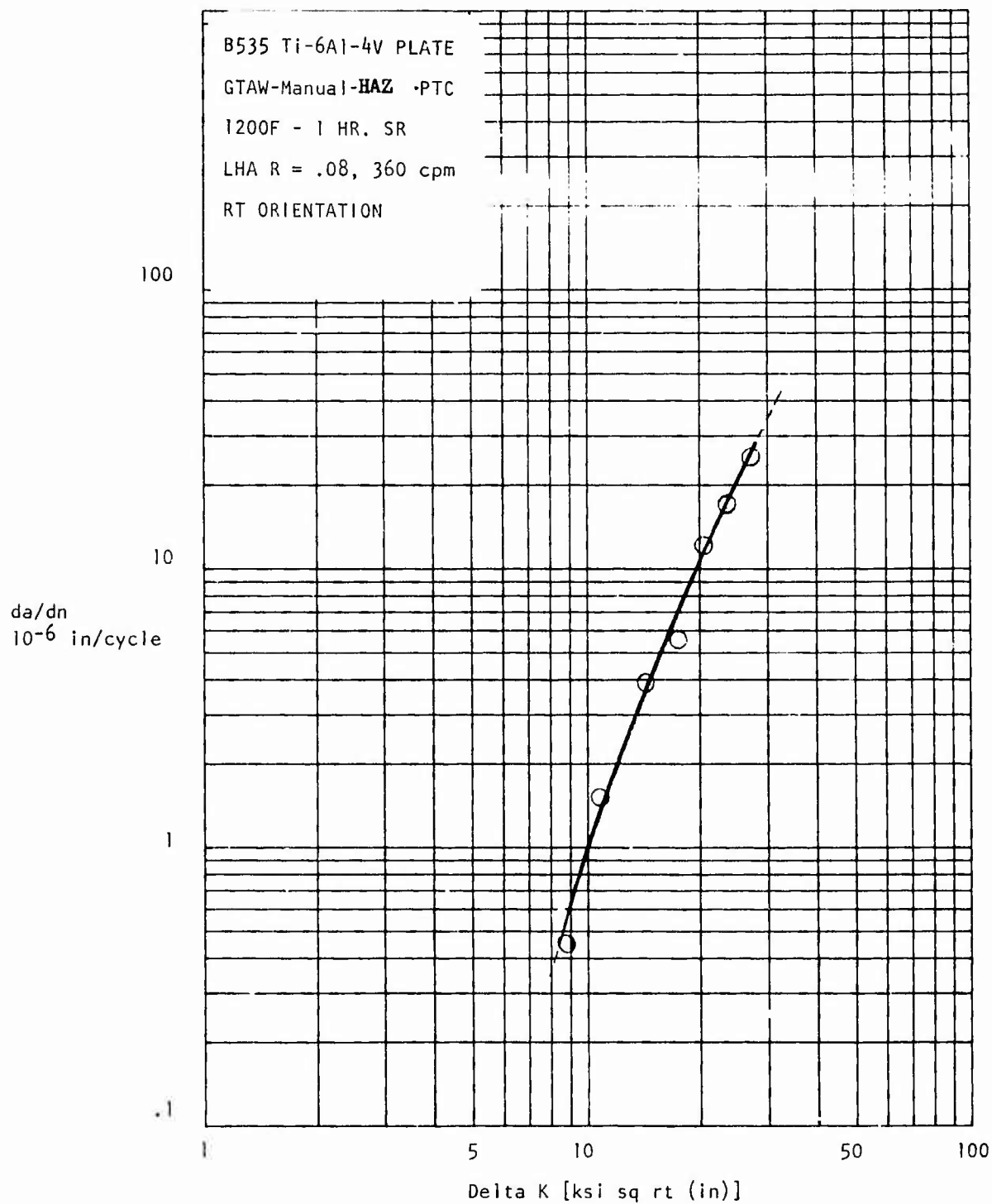


Figure 88 NRT B535

Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

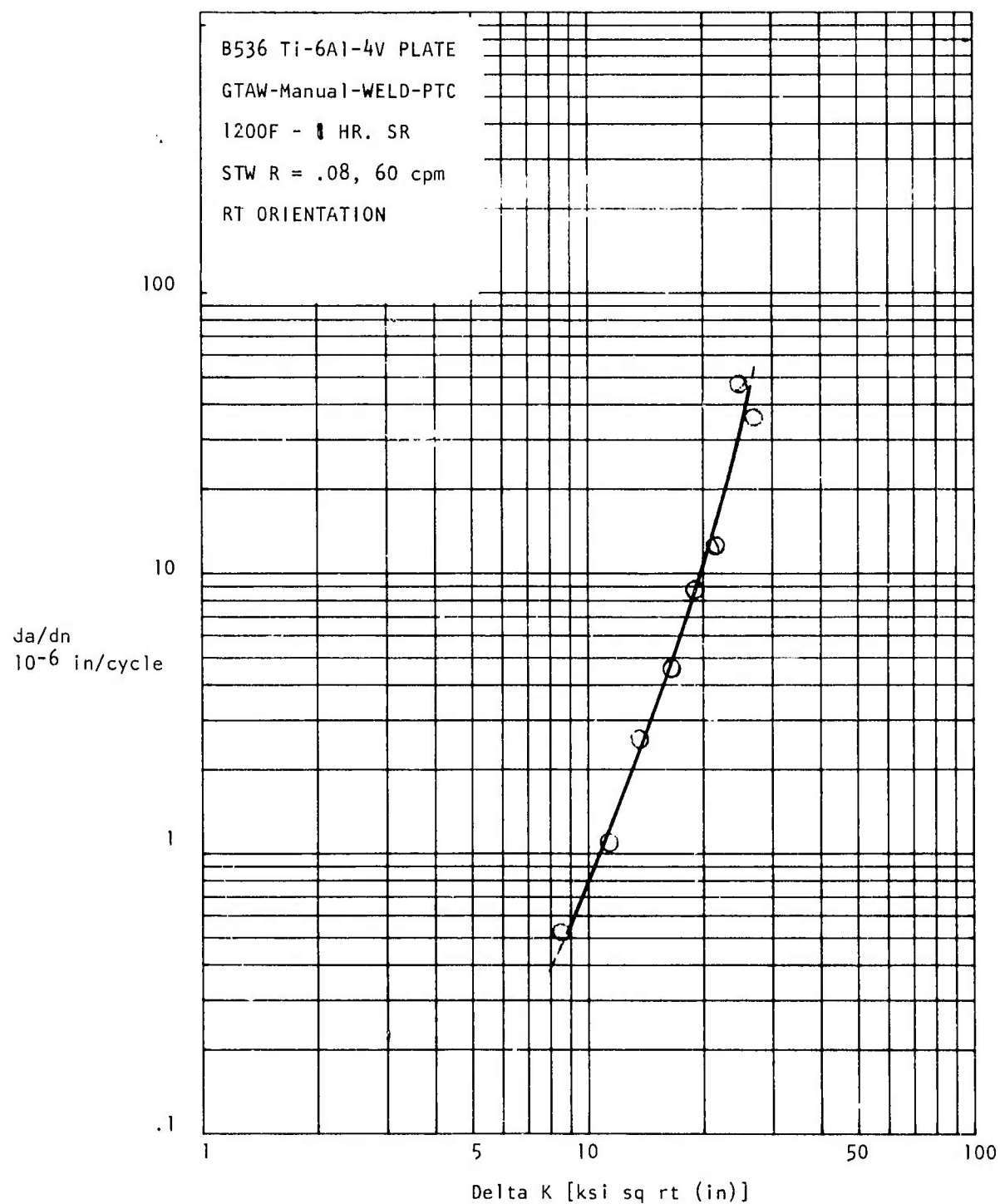


Figure 88 NRT B536

Fatigue Crack Growth Rate in the Weld Metal of a Welded Ti-6Al-4V Plate PTC Specimen in STW

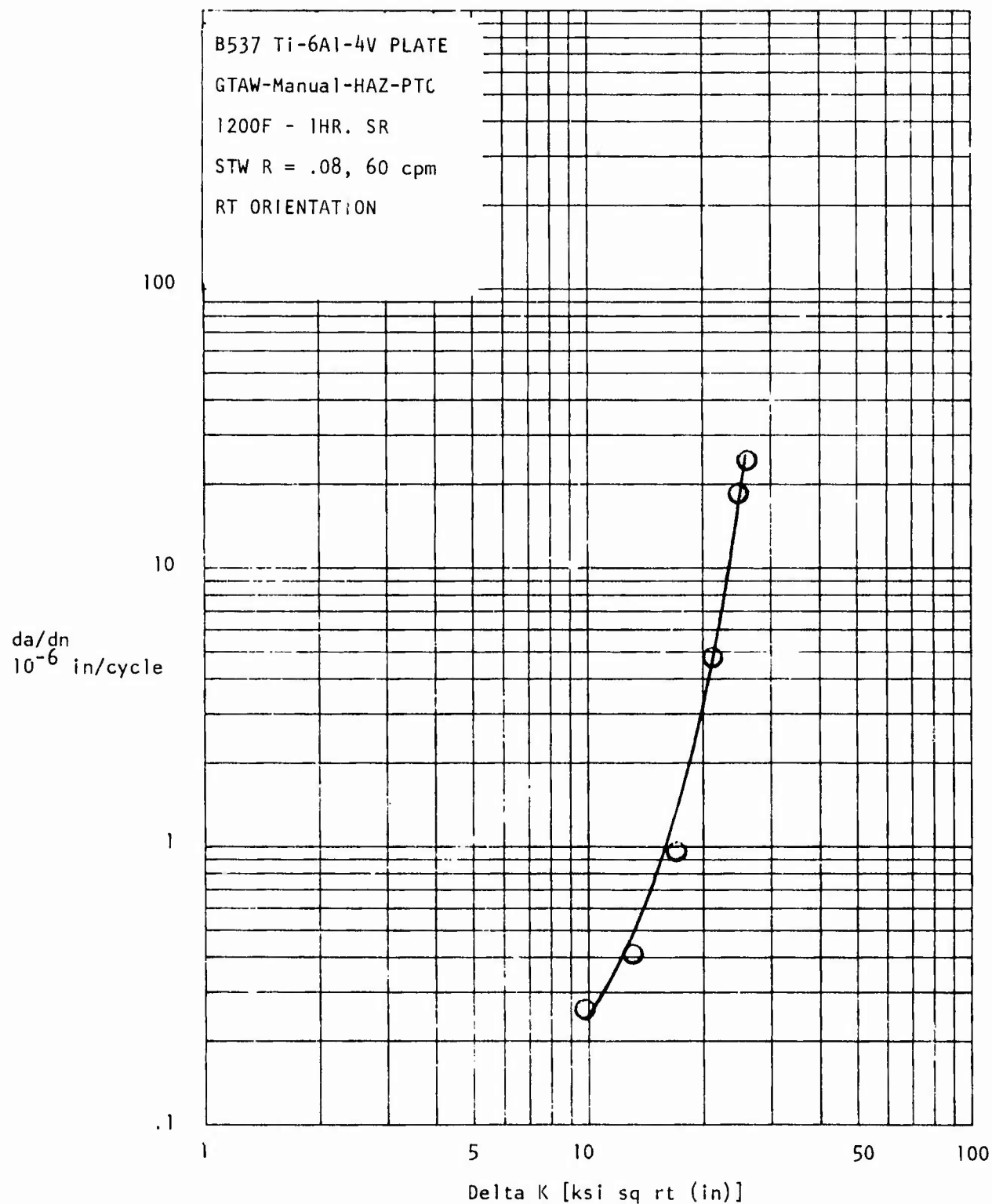


Figure 88 NRT B537

Fatigue Crack Growth Rate in the HAZ of a Welded
Ti-6Al-4V Plate PTC Specimen in STW

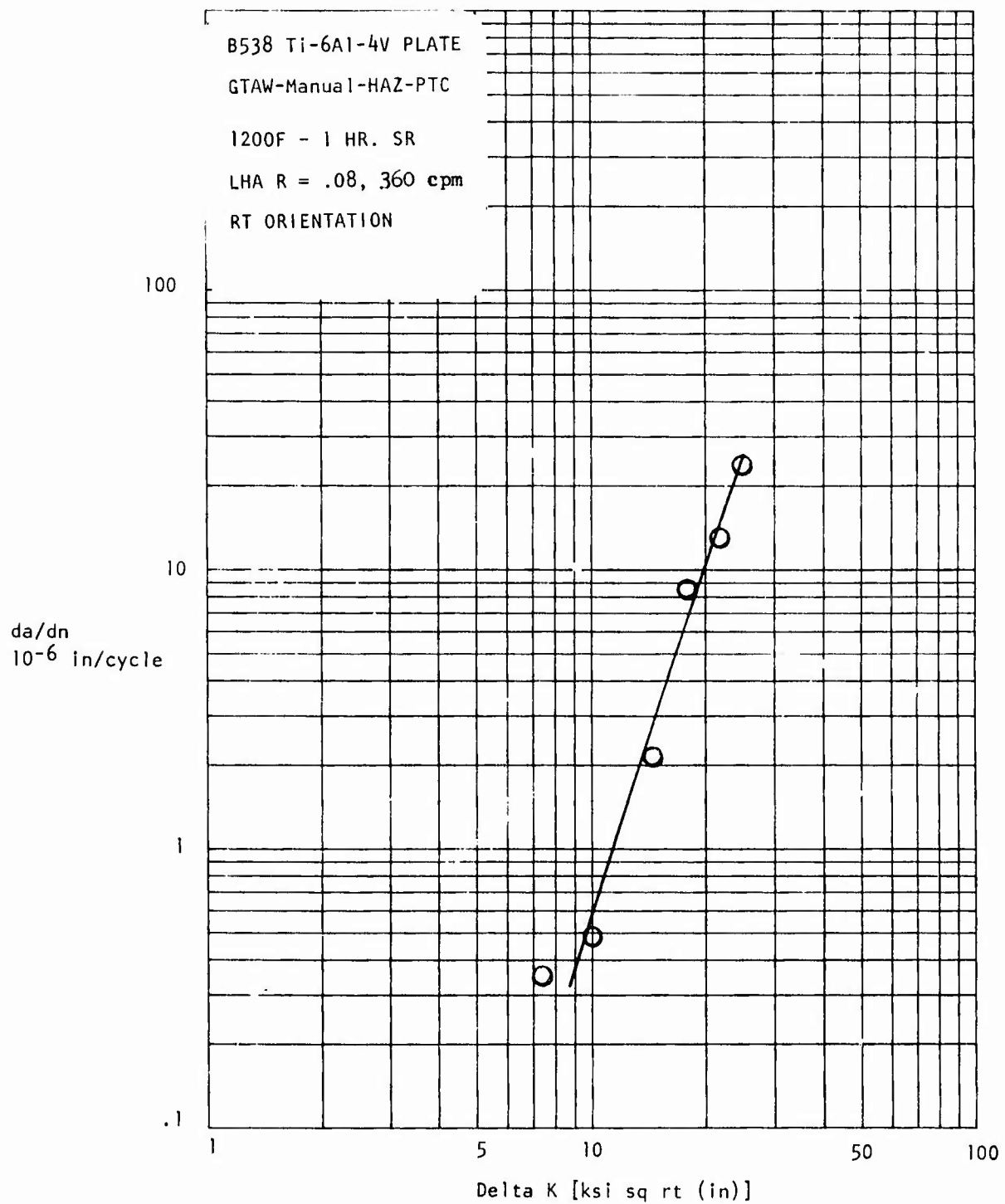


Figure 88 NRT B538

Fatigue Crack Growth Rate in the HAZ of a Welded
Ti-6Al-4V Plate PTC Specimen in LHA

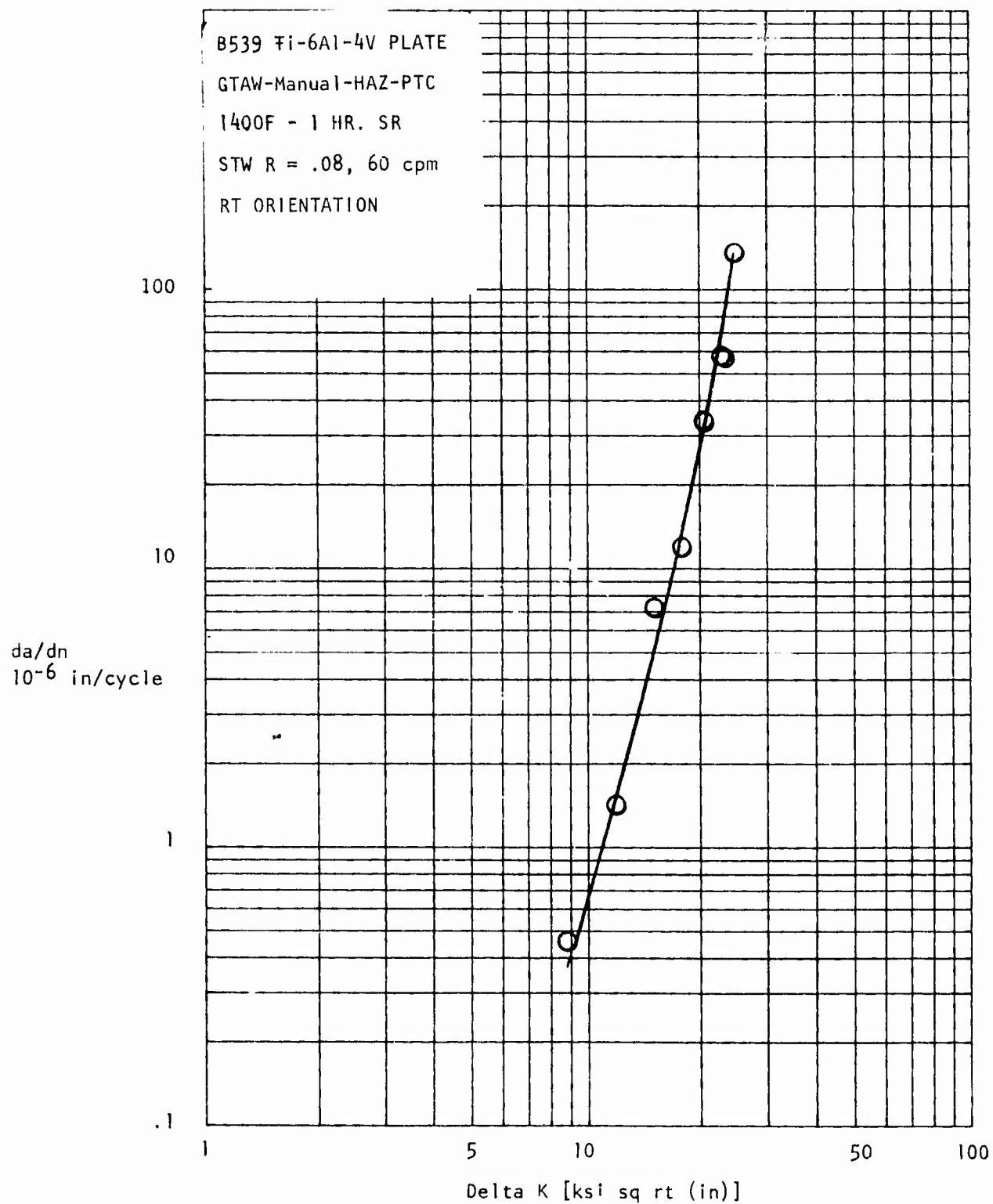


Figure 88 NRT B539

Fatigue Crack Growth Rate in the HAZ of a Welded
Ti-6Al-4V Plate PTC Specimen in STW

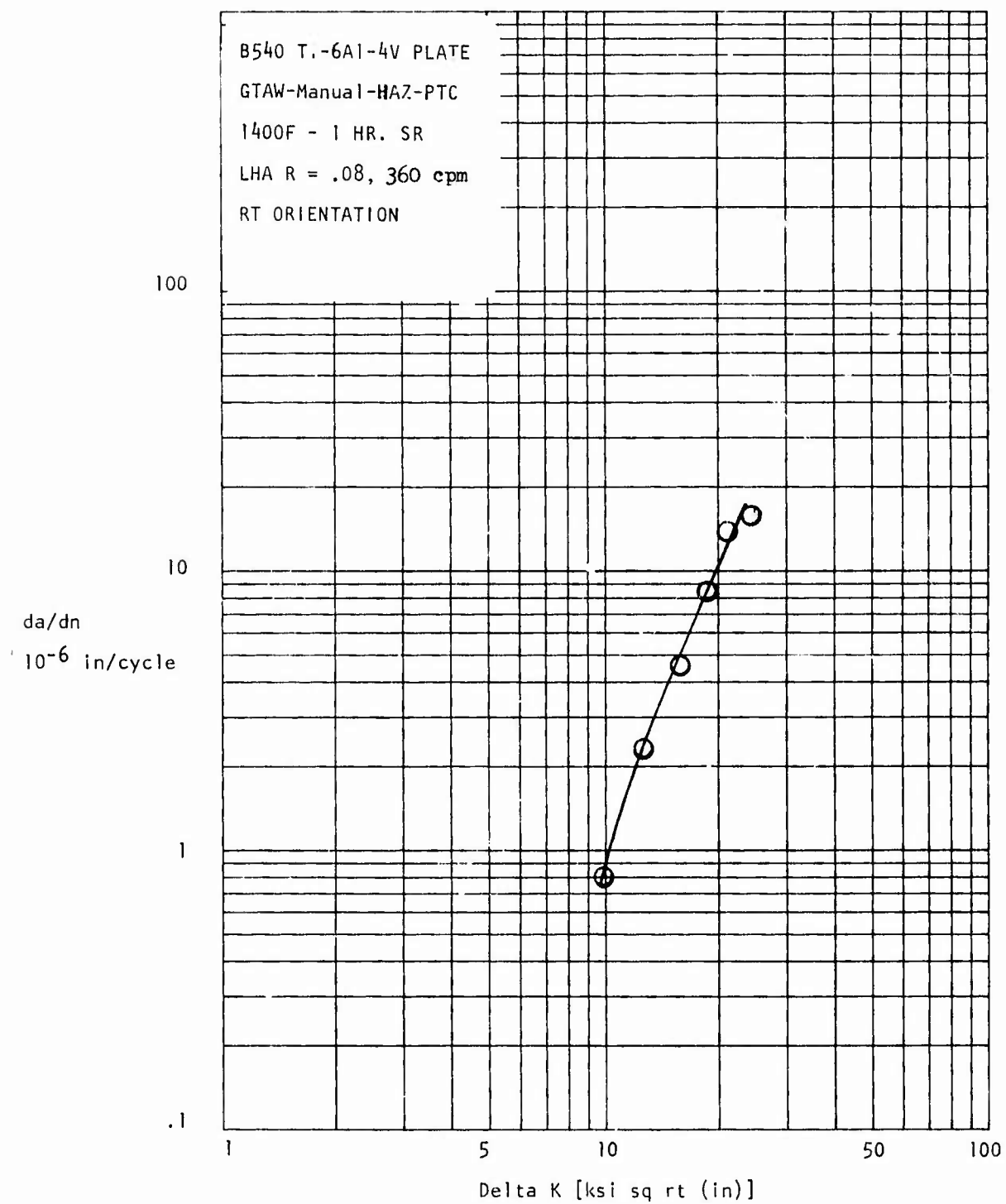


Figure 88 NRT B540 Fatigue Crack Growth Rate in the HAZ of a Welded
 Ti-6Al-4V Plate PTC Specimen in LHA

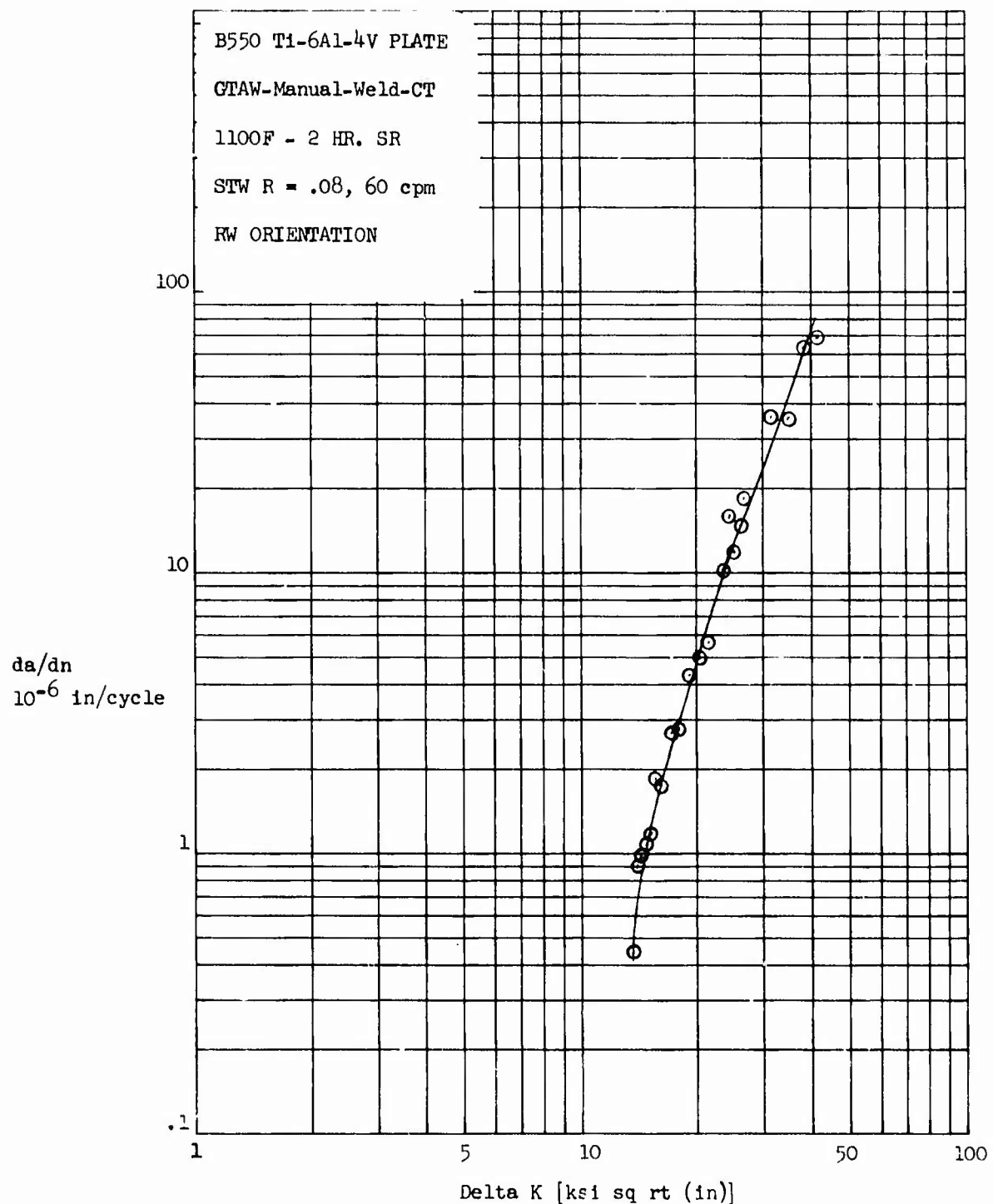


Figure 88 NRW B550

Fatigue Crack Growth Rate in the Weld Metal of
a Welded Ti-6Al-4V Plate CT Specimen in STW

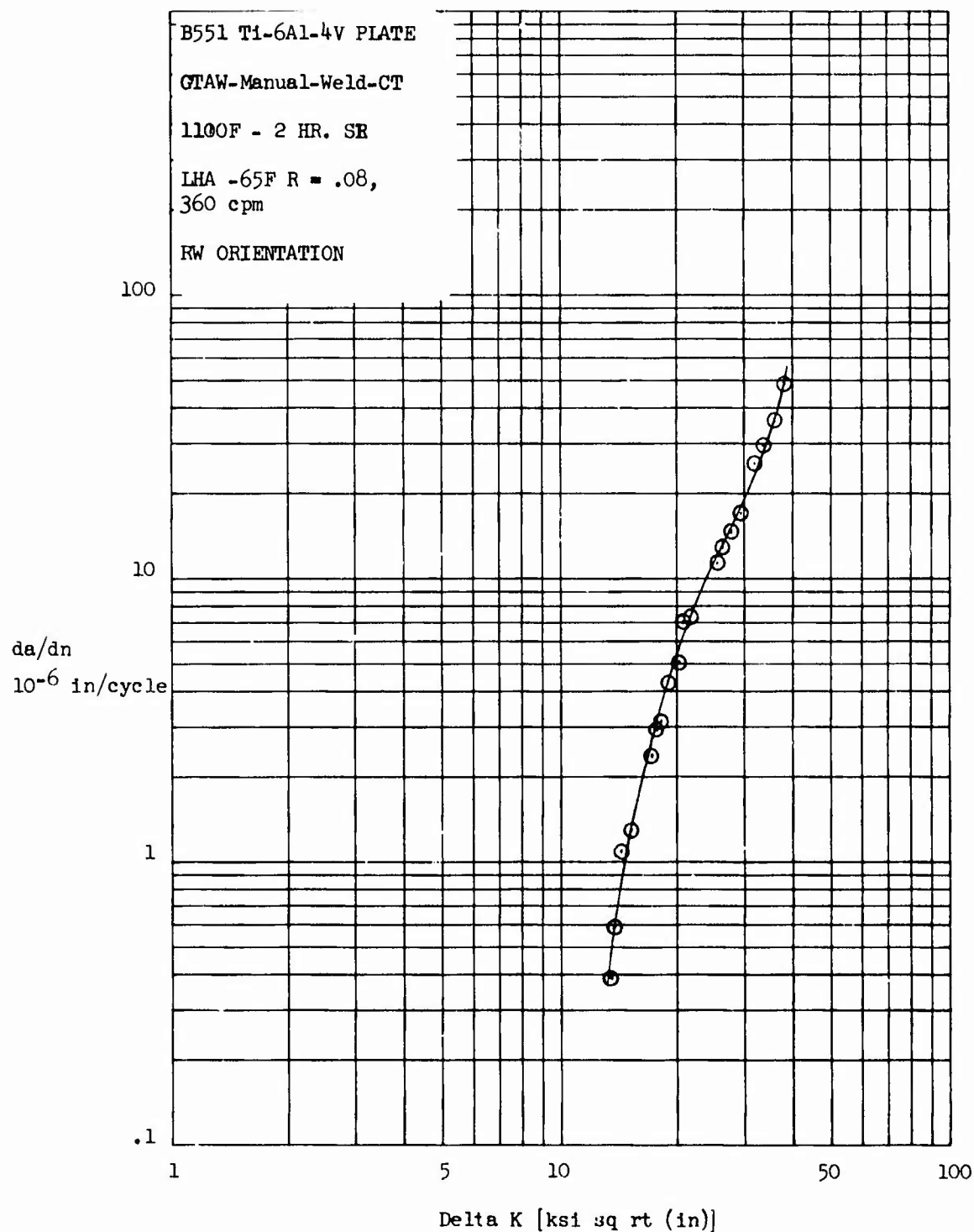


Figure 88 NRW B551 Fatigue Crack Growth Rate in the Weld Metal of a Welded Ti-6Al-4V Plate CT Specimen in LHA

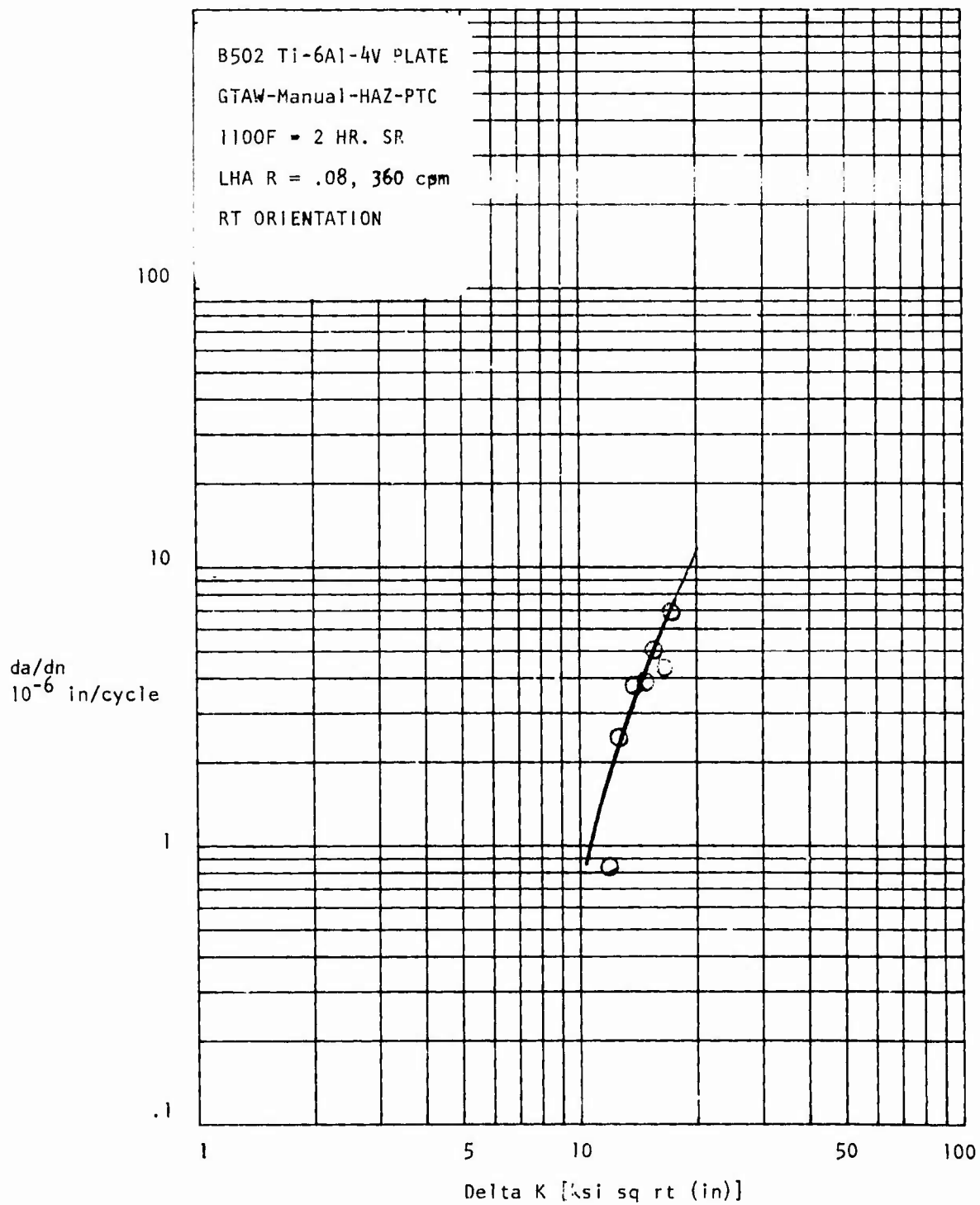


Figure 89 NRT B502

Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA